A Poverty of Riches

New Challenges and Opportunities in PLA Research

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PREFACE

This volume is the product of a conference, jointly sponsored by the RAND Center for Asia-Pacific Policy (CAPP) and the Taiwan-based Chinese Council of Advanced Policy Studies (CAPS). The meeting was held in Washington, DC from 22-24 2001, and brought together many of the world's top experts to evaluate new methodologies and trends in research on the Chinese People's Liberation Army (PLA). The resulting volume represents the very latest and most cutting-edge work in the field, especially with regard to Internet- and primary source-based inquiries on PLA affairs. Previous volumes in this conference series include:

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GLOSSARY, LIST OF SYMBOLS, ETC.

Symbol	Definition
ADCON	Administrative Control
AMS	Academy of Military Science
BADCC	Beijing Aerospace Directing and Controlling Center
BBS	Bulletin Board Systems
BNS	*Beidou* Navigation System
C2	Command and Control
C3I	Command, Control, Communications, Intelligence
C4I	Command, Control, Communications, Computers, Intelligence
CAJ	China Academic Journals
CAST	Chinese Academy of Space Technology
CCTV	China Central Television
CDSTIC	China Defense Science and Technology Information Center
CESEC	China Electronic Systems Engineering Corporation
CETIN	China Engineering and Technology Information Network
CICIR	Chinese Institute of Contemporary International Relations
CMC	Central Military Commission
COSTND	Commission on Science and Technology for National Defense
CPD	Chinese Periodical Database
CSIC	China Shipbuilding Industry Corporation
CSSC	China State Shipbuilding Company
DISA	Defense Information Systems Agency
ELINT	Electronic Intelligence
FBIS	Foreign Broadcast Information Service
FSW	Fanhui Shi Weixing
GAD	General Armament Department
GLD	General Logistics Department
GLONASS	Global Orbiting Navigation Satellite System
GPD	General Political Department
GPS	Global Positioning System
GSD	General Staff Department
JTF-CNO	Joint Task Force for Computer Network Operations
LEO	Low Earth-Orbit
MEO	Middle Earth-Orbit
MLEC	Martial Law Troop Enforcement Command
MUCD	Military Unit Code Designator
NATO	North Atlantic Trade Organization
NCO	Non-Commissioned Officer
NDU	National Defense University
NSA	National Security Agency
OODA	Observation, Orientation, Decision, and Action

OPCON	Operational Control
OSD/C3I	Office of the Secretary of Defense for Command, Control, Communications, and Intelligence
PAP	People's Armed Police
PGM	Precision Guided Munitions
PLA	People's Liberation Army
PLAAF	People's Liberation Army Air Force
PLAN	People's Liberation Army Navy
PME	Professional Military Education
PRC	People's Republic
RMA	Revolution in Military Affairs
SIGINT	Signals And Communications Intelligence
SOP	Standard Operating Procedure
TAR	Tibetan Autonomous Region
UAV	Unmanned Aerial Vehicle
USAF	United States Air Force
VSAT	Very Small Aperture Terminal
WTO	World Trade Organization

1. PROFESSIONAL MILITARY EDUCATION IN THE CHINESE PEOPLE'S LIBERATION ARMY: A PRELIMINARY ASSESSMENT OF PROBLEMS AND PROSPECTS

By Thomas J. Bickford

INTRODUCTION

The development of better officer education is one of the most important aspects of the PLA's modernization drive. The PLA may acquire new equipment, undergo reorganization, issue new combat regulations, and make declaratory changes in doctrine, but without a well-developed educational system the PLA will not be able to fully implement any of its modernization efforts. At a minimum, professional military education (PME) provides the knowledge necessary to conduct combat operations and operate existing military technology. As the level of technology becomes more important in the conduct of warfare, however, so too does the quality of PME. Moreover, the life cycle of any given technology is continually growing shorter and knowledge is becoming outdated more quickly. Therefore, PME needs to provide officers (and career NCOs) with the intellectual tools, structure, and technological background necessary to constantly update their knowledge throughout their careers.   As officers move up the chain of command they not only need to learn how to command and control larger unit formations, but they also need to understand the changing technological environment.

As will be argued in this paper, a large part of the Chinese military education system, at least through the 1980s, was aimed at teaching officers how to conduct combat operations and to fully utilize the combat systems at the level of command they are assigned. PME also had to provide technical education for military specialists.[1]   Since then, course content has begun to converge towards its U.S. counterpart; that is, courses are now also being offered on such subjects as international relations, psychology, management, strategic budget development and military theory emphasizing social science as well as purely military matters. This change in the curriculum is necessary if the Chinese are to build a more competent military and indicates a growing recognition in China that a truly competent military must include more than the ability to conduct combat.

PME, however, does mean more than this. PME also provides a common military language and a common methodology for problem identification and solving. PME ideally allows for the dissemination, socialization and standardization of doctrine. The value of this was amply demonstrated by the American experiences in World War II.

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[1] William R. Heaton, "Professional Military Education in the PRC," in Paul H. B. Godwin, ed., *The Chinese Defense Establishment: Continuity and Change in the 1980s*, Boulder: Westview Press, 1983, p. 131.

Because of a strong emphasis on PME in the interwar years, the United States had a small, but well-prepared officer corps that could successfully manage the rapid expansion and mobilization that took place after 1941. Graduates of the staff colleges could be placed on any staff and could function effectively as a result of a common educational background. At higher levels of command, PME provides the common language and methodology needed to conduct large-scale combined arms operations.

Military academies are, or should be, arenas for debate about all aspects of the military, such as doctrine, tactics, appropriate equipment, who is a potential enemy, how to prepare for the next war, what went wrong in the last conflict and why. PME can also function as a laboratory for testing ideas and conducting research on the changing nature of war. It allows officers to come together and exchange ideas and to change officer culture and outlook. Again, the American experience offers telling examples. In the 1930s the Naval War College developed and tested many ideas on how a future war with Japan might be fought. Vietnam combat veterans-turned-PME instructors played an important role in re-evaluating many aspects of American military practice.[2] It is only since the mid-1980s that PME in China has begun to move in this direction.

PME can also have an ethical dimension. In western militaries this might take the form of fostering an honor code, instilling better discipline, or teaching officers the difference between lawful and unlawful orders. Despite an increasingly professional focus, Chinese PME still indoctrinates future leaders of the PLA with the basics of Marxism-Leninism-Mao Zedong Thought and loyalty to the Chinese Communist Party. Ethical issues are a subset of political education: if one is politically correct then one is also ethical, as a good communist can do wrong.

Finally, a subtle but well argued aspect of PME is that a more professionally oriented military is also a less political military. Huntington's argument is well known on this point: the more professional the military, the less politically active it is apt to be. Many observers of the PLA have also discussed the tensions between a professional PLA and a PLA that is supposed to be the armed instrument of the Party. An important question, then, in looking at Chinese PME is the impact of future developments in the PME system on this basic tension in the PLA-Party relationship.

This paper provides an overview of the development of PME in the PLA since 1950. The PLA has gradually improved the quality of its educational system and thereby the basic educational level of its officers, though many significant problems remain. Moreover, and perhaps more importantly in the long term, the nature of PME in China is changing, moving from a highly specialized system based on the Soviet military towards a system that increasingly looks like the American system (in form if not always in content). These changes in structure, teaching style and content, and goals have very significant implications for the combat potential of the PLA in the 21st century.

BRIEF OVERVIEW OF MILITARY EDUCATION UNDER MAO

While the history of military education in the PLA dates back to 1933 and the guerrilla war period, it was not until the founding of the People's Republic (PRC) in 1949

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[2] See Richard Cheney, et al., *Professional Military Education: An Asset for Peace and Progress*, CSIS Study Report, Washington, DC: CSIS, 1997.

that a regularized system of military education began to take shape. The Maoist period can be roughly divided into four phases. The first phase, from 1949-1955, saw the establishment of a basic educational structure. The second phase, 1956-1965, witnessed the consolidation of a Soviet style PME system despite a number of problems. The third phase, 1966-73, saw an intense attack on the military education system and its near destruction. The fourth phase of the Maoist era, 1973-78, was one of essentially damage control and partial rebuilding.

Before 1949, military education was primarily a matter of political education, literacy, and the imparting of a few basic military skills. It was not professional education in any sense of the word that Western militaries would recognize. PLA officers were essentially generalists who primarily learned their business through practical experience. Political officers could substitute for military commanders and vice versa. The PLA was basically an infantry force with very few specialized units. Specialized functional knowledge was simply not needed for the most part and there was little standardization across units. As with the party leadership, most PLA commanders were highly skilled in their tasks but had little formal education.

That, however, changed with the founding of the PRC. The PLA had to transform itself into a modern armed force with naval, air, armored, and other specialized units. It required a well-established educational system to provide the officers, NCOs and other specialized personnel needed to run this new armed force. With Soviet help, the new military education system expanded rapidly. Very early on, military academies were established for the People's Liberation Army Navy (PLAN), People's Liberation Army Air Force (PLAAF), engineering troops and others. In addition to specialized schools set up for each new branch of service, the PLA set up a series of command schools, divided into low level, (platoon, company), midlevel (battalion, regiment), and high levels (division, army) as appropriate for the rank being trained. Some specialized schools trained both officers and NCOs; others specialized in either officer training or NCO training.

By 1955 the PLA had a total of 253 military academies and schools. Of these, 26 were command schools, 6 were political commissar schools, 72 were technical schools, 35 were preparatory schools and 98 were cultural schools.[3] Cultural schools taught military personnel to read and write, while the preparatory schools were somewhat more advanced but basically served to bring military personnel up to a basic educational level. These schools were a temporary phenomenon reflecting the low levels of education in China at that time. As a basic educational structure was put in place throughout the country, the quality of recruits increased and after 1956 the numbers of cultural and preparatory schools declined rapidly while political and command academies increased.[4] This period was essentially transitional, as the large number of basic educational schools indicates.

Most of the technical schools were initially highly dependent on Soviet instructors and advice. This was especially the case in the military academies of the PLAN and

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[3] *Zhongguo junshi jiaoyu tongshi* [A Comprehensive History of Chinese Military Education], Shenyang: Liaoning chubanshe, 1997, Vol. 2, p. 957.

[4] Ibid., Vol. 2, p. 957.

PLAAF, where the PLA had almost no indigenous expertise to draw upon other than relatively small numbers of KMT defectors. Within the ground forces, by contrast, the PLA could draw upon a large number of experienced combat veterans to develop a teaching staff. At this time, the primary criteria for being selected as an instructor were a good political and combat record, not necessarily a well developed expertise in the subjects to be taught. There were, therefore, significant limitations on the quality of teaching. One of the most striking examples of this can be found in the Huadong Naval Academy where the naval instructors had been infantry commanders only a few weeks earlier![5] Thus, while the 1949-55 period saw the creation of a basic educational system for the PLA, serious questions remain about the quality of that education.

The rapid expansion of the number of institutions also raises questions about the quality of the instructional staff. The pool of talent was rather small and remained so even after the initial batches of cadres had gone through Soviet-taught classes. Instructors with the necessary technical qualifications were in short supply, as were instructors with an ability to teach. The number and variety of courses offered would also be limited by the available teaching staff and the system remained dependent on Soviet military schools for advanced education and more specialized courses.

Nevertheless, despite these constraints, the educational system continued to develop once a basic backbone had been established. With the phasing out of the cultural and preparatory schools, the total number of schools between 1959 and 1965 fluctuated between 119 and 125.[6] The precise number varied as new specialized schools were set up, split off from existing schools or merged with other schools. Reorganizations appear to be based primarily on shifting perspectives of the right mix of specialties. For example, academies were added to deal with radar engineering, armored troop engineering among others. In fact, most of the new schools created in the early 1960s were specialized engineering schools.[7] One source states that on the eve of the Cultural Revolution, engineering and technical schools accounted for 62% of all military academies in China.[8]

In 1959 the period of study at military academies was generally set as follows: command academies, 3 years; political academies, 2 years; specialized technology and medical schools, 4-5 years; polytechnic schools, 2 years; flight school, 2 years; and preparatory school, 1 year.[9] Altogether, military academies produced 269,000 cadres between 1950 and 1959.[10]

The system that existed between 1956 and 1965 was very much like that of the PME system in the Soviet Union, despite the attack on over reliance on Soviet practices during the Anti-Dogmatism Campaign and the Sino-Soviet split. As with the Soviet system, the Chinese PME system tended to be highly specialized along functional lines.

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[5] David G. Muller, *China as a Maritime Power*, Boulder: Westview Press, 1983, p. 14.

[6] *Jiaoyu tongshi*, Vol. 2, p. 957.

[7] Han Huaizhi and Tan Jingqiao, eds., *Dangdai Zhongguo jundui de junshi gongzuo* [Contemporary China's Military Affairs], Beijing: Zhongguo shehui kexue chubanshe, 1989, Vol. 1, p. 484.

[8] Ibid.

[9] Ibid., p. 483.

[10] Ibid; and *Jiaoyu tongshi*, Vol. 2, p. 957.

Chinese military personnel were very narrowly educated. Officers in command schools received little, if any exposure to more technical subjects. In the PLAN, officers taking navigation courses would not be educated in observation and communication.[11] The fact that there were separate engineering academies for armored and radar troops or that armored command and armored engineering were taught at separate academies also speaks to the high degree of functional specialization in the Chinese PME system at this time.[12]

The Sino-Soviet conflict created problems for the PLA as it meant an end to Soviet assistance and access to Soviet military academies, the latter of which provided further educational opportunities unavailable in China. The Sino-Soviet split also meant that for the next two decades the PLA was cut-off from direct contact with many militaries, and valuable experience and ideas were lost due to the lack of opportunities for exchange. This is not to say the PLA was in a complete vacuum, as they were aware of outside developments, but only from a distance that made assessing changes in warfare difficult.

The Anti-Dogmatism Campaign, which heavily criticized excessive reliance on Soviet practices, also had an impact on PME, though evaluating that impact is difficult. In some respects it was less of a problem for the ground forces than the Navy and Air Force. Despite the introduction of new types of combat troops, ground forces continued to be dominated by infantry units. Here PLA leaders and academy instructors could draw upon their own experiences to develop a more Chinese way of looking at military issues. Many professionally-oriented officers in the ground forces did indeed question over reliance on the Soviets. However the campaign was more problematic for the specialized branches of the armed forces, especially the Navy, where the general lack of experience and traditions and the services made it more dependent on the Soviet model. From the Chinese commentary, it does appear that the atmosphere was more difficult for military instruction in these areas, and that military education suffered to an indeterminate degree.

Chinese sources do not indicate that military education was given a high priority in the late 1950's and early 1960's. The education system certainly did expand and reorganizations were periodically carried out, but it does not seem to be a pre-eminent concern within the PLA. This was, perhaps, not surprising given the political climate, when too much emphasis on professionalism was suspect with many CCP leaders. In addition, given the past successes of the PLA, the need for better education was not immediately obvious to all PLA leaders. Still these issues might have been addressed and PME allowed to continue to develop if not for the Cultural Revolution.

The Cultural Revolution was a period when military education came under severe attack. The academies stress on academic credentials and professional accomplishment was the antithesis of many of the themes of the Cultural Revolution. The system of ranks and other distinctions between officers and enlisted personnel, as well as PME's emphasis on technology, were all seen as taking the "bourgeois line" in army building. Military schools suffered from the same depredations as civilian institutions of higher learning. Professors were attacked and classes were disrupted. Academic and

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[11] PLA Service Branch History Series, *Haijun shi* [A History of the Navy], Beijing: Jiefangjun chubanshe, 1989, pp. 252-53.

[12] *Dangdai junshi*, pp. 483-4.

professional criteria for promotion were rejected and the PLA went back to its old heritage of promotion from the ranks based on political rectitude, rather than on courses taken at higher institutions.

Of the 125 military academies and schools that existed at the beginning of the Cultural Revolution, a total of 82 or about two thirds were shut down.[13] Of the remaining 43 academies, 19 were either merged with others or relocated.[14] The sheer number of schools closed is indicative of the concentrated attack on the military education system, but the full extent of the damage only becomes clear when looking at the details. The 82 schools that were closed down represented 97% of the command schools, 50% of the technical schools, and 75% of the medical schools.[15] While the educational system began to revive after 1973 under the auspices of Marshal Ye Jianying, the damage done over the previous years was incalculable. Libraries and other educational resources had been destroyed and teaching staff scattered.[16] Several years went by in which there was no effective education. Officers fell even further behind international standards and leaders were unable to keep up with military developments elsewhere. Those texts that still were in use dated back to the 1950s and were in serious need of updating. Technical personnel could not update knowledge of their craft. Many unfit officers had received promotions on the basis of political criteria and were woefully unqualified for their new posts. Standards among various parts of the army diverged, making it increasingly difficult to effectively coordinate large numbers of troops. This was painfully demonstrated in China's brief conflict with Vietnam in 1979. Many officers in the conflict did not even have basic map reading skills let alone the ability to perform more complicated tasks.

By the end of the 1970s the PLA's educational system was beginning to revive, growing to 116 military academies of which 40 were command academies, 5 were political academies, 54 were technical academies and 17 were flight academies.[17] While the exact mix of school types appears to be different from that of just before the Cultural Revolution there is little evidence of development during this period. Rather institutions were simply being resurrected often with few resources left over from the depredations of the Cultural Revolution. This transition period should instead be seen as a period of damage control.

PME IN THE POST-MAO ERA

The post-Mao era has seen significant changes and improvement in the PLA's educational system, though it has not been simply an exercise in restoring the pre-Cultural Revolution PME system. Rather, extensive efforts have been made to upgrade PME and several important innovations have taken place. Specifically, PME continues to evolve away from a highly functionally specific education, reflecting a narrow definition

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[13] Ibid., p. 485.

[14] Ibid.

[15] Ibid.

[16] Ellis Joffe, *The Chinese Army After Mao*, Cambridge: Harvard University Press, 1987, p. 122.

[17] *Dangdai junshi*, Vol. 1, p. 487; and *Jiaoyu tongshi*, p. 958.

of professional education, towards a form of PME that encompasses a much broader conception of officer education.

Rebuilding and Expanding PME in the 1980s

Many in the post-Mao leadership were keenly aware of how far the PLA had fallen behind in all aspects of military preparedness. Deng Xiaoping in particular stressed making military education a priority in army building. Noting that the days when all a company leader needed to know was how to raise his Mauser and yell "charge" were long gone,[18] Deng argued that the military needed to provide an educational system that could train all officers from the company level up in combined arms operations. In another speech he noted that no one, including veteran cadres, had sufficient skills for modern warfare.[19] A better education system, along with retirements and cuts in personnel and deployment of new equipment were regarded as key reforms to turn the PLA around. Deng's support was important in that it provided a clear political endorsement of a more professionally oriented education system in the PLA, something which was lacking in the Maoist era. Combined with the PLA's experiences in Vietnam and lessons learned from the Falklands War, PME was seen as more important than ever.

Yet, conditions in the PLA at the end of the 1970s were abysmal. One article in *Jiefangjun Bao* claims that, by the end of the Cultural Revolution, less than 30% of PLA units could be regarded as fully trained.[20] Given that most of the senior positions in the PLA were still held by revolutionary war veterans and that many of the lower ranks were filled with officers promoted during the Cultural Revolution, educational levels in the PLA were understandably low. One source states that in 1978 only 8% of all PLA cadres had college degrees or the equivalent.[21] Another source puts the figure at 10%.[22] Educational rates were still low in 1982. One Xinhua report stated that only 1.2% of officers at the army level had a college level education. Corresponding figures for divisional level and regional level cadres were 1.6% and 2.2%, respectively.[23]

The PLA moved fairly quickly to rectify this situation. In 1980 strict guidelines were laid down ending the practice of direct promotion from the ranks. Instead, all officers were required to be graduates of a military school. Candidates for the military academies needed to have at least a senior middle school education and pass the same entrance requirements as required for accession into civilian colleges and universities.

The system of command education was reestablished. Each military region now had its own command academy, as did the various service branches (see appendix for a

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[18] Deng Xiaoping, *Selected Works of Deng Xiaoping, 1975-1982*, Beijing: Foreign Languages Press, 1984, p. 34.

[19] Ibid., p. 75.

[20] "A Great Military Reform: Roundup of Strategic Changes in Our Army Building," *Jiefangjun bao,* 18 December 1998, translated in FBIS-CHI, 18 December 1998.

[21] "PLA Officers, Soldiers Become Better Trained," *Xinhua,* 29 September 1994, translated in FBIS-CHI, 29 September 1994, p. 57.

[22] "A Great Military Reform: Roundup of Strategic Changes in Our Army Building," *Jiefangjun bao,* 18 December 1998.

[23] "PLA Reviews Military, Civilian Cadre Systems," *Xinhua,* 28 July 1988, translated in FBIS-CHI, 28 July 1998, p. 20.

list of military academies). In general, lower-level command schools emphasized small unit tactics and concentrated on company level combat skills. Mid-level command schools focused on command and combat skills and were primarily directed at regimental cadres. High-level command schools focused on military thought, campaign strategy, and history, and were primarily aimed at divisional and army level cadres.[24] Courses at this level could last from one to three years depending on subject matter and the level of command.

Other areas of the military command system were also regularized in the 1980s. Technical academies offered a variety of courses from basic to advanced levels for officers, NCOs and other specialists. As in the past, technical schools comprised the bulk of military academies. Courses ranged from two to four years depending on specific technical training, while medical courses required six years.[25] Separate schools for warrant officers were also established.[26] At one point the number of schools and academies eclipsed 130, but the number has come down.[27] The precise number and focus of technical schools has tended to vary according to perceptions of which areas the PLA needs to emphasize. These changes, however, have been relatively minor.[28]

Perhaps the most important aspect of the regularization of PME after 1980 was the creation of the National Defense University (NDU). NDU was established in 1985 by combining three existing academies: the Political Academy, the Military Academy and the Logistics Academy. One measure of the importance attached to the new PLA educational institution is the fact that its bureaucratic rank is much higher than the original three academies, equivalent to that of a military region.[29] The creation of NDU was also a crucial development in Chinese PME in other ways. Up until this time PME was essentially single service in nature. The NDU was the first truly all-PLA academy. This was a vital step for PLA leaders to acquire the skills and social interactions necessary to conduct true joint combat. The three month capstone course offered every autumn is particularly important in this regard, bringing together a small group of high ranking officers from the various services into a single seminar focusing on specific issues. This emphasis on jointness in education does mark a significant improvement in PME when compared to the past. However, the PLA needs to make much greater efforts in this area if it is to be able to conduct joint operations more effectively in the future. Despite the fact that NDU is a joint service institution, foreign visitors are unanimous in noting the dominance of the ground forces at NDU and that most of the senior ranking instructors are from the ground forces though officers from the PLAAF and the PLAN have recently received permission to wear their service uniforms. Moreover, NDU

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[24] Xue Lianxin and Zhang Zhenhua, eds. *Zhongguo junshi jiaoyu shi* [A History of Chinese Military Education], Beijing: Guofang daxue chubanshe, 1991, p. 404.

[25] *Jiaoyu tongshi*, Vol. 2, pp. 1064-65.

[26] Ibid., p. 1065.

[27] For a good discussion of the structure of officer education in the 1980s, see Lonnie Henley, "Officer Education in the Chinese PLA," *Problems of Communism,* May-June 1987, pp. 55-71.

[28] For an overview of the most important PLA academies and their histories, see *Jiaoyu tongshi*, Vol. 2, pp. 1065-1072.

[29] "China National Defense University: Cradle of Generals," *Kuang chiao ching,* 16 December 1998, translated in FBIS-CHI, 16 December 1998.

primarily focuses on the education of high-ranking officers. The PLA has yet to develop a system of joint service education for officers at lower levels of command, even though those officers will need combined arms know how if the PLA is to further improve its combat potential. Nevertheless, the PLA has taken the first steps in developing a core leadership with a knowledge and understanding of combined arms operations, marking both a departure and an improvement of the Maoist PME system

As of 2002, NDU remains the premier PME institution within China, concentrating on the further education of high-ranking officers, usually at the division level and above. By the late 1990s approximately 90% of all leaders in the ground, naval, and air forces above the level of army commander were graduates of NDU.[30] One source puts the total number of NDU graduates between 1985 and 1998 at some 5,000,[31] though it is unclear how many of those graduates have since resigned or retired. The same source notes that NDU has also produced at least 400 Ph.D. and master's degrees. As a joint educational institution, NDU plays a significant role in developing research on future directions in war. Many of the PLA's writers on the Revolution in Military Affairs (RMA) are associated with NDU.[32]

NDU also plays a role in exchanges with other armed forces and has developed ties with a number of foreign defense education institutes including the National Defense University in the United States and Britain's Sandhurst. NDU students and instructors have participated in over 60 overseas delegations.[33] In 1998, some 100 NDU teachers traveled abroad as visiting scholars.[34] NDU has also played host to a number of guest lecturers including former U.S. Secretary of Defense Caspar Weinberger, and chiefs of staff of the Swedish, British and Italian armed forces.[35] However, American scholars who have visited NDU noted that foreign officers studying at NDU are housed on a different campus and that most of the NDU delegations abroad are dominated by ground force personnel.[36] This suggests that while NDU does indeed play an important role in the exchange of personnel and views with other military establishments, the full potential for exchange is not realized as the PLA retains strong reservations about how far it wishes to go in terms of foreign military contacts and exchange. Finally, NDU is involved in educational outreach towards other parts of the PME system. Since 1998 NDU has been running high-tech training courses across the army for the General Political Department (GPD) on a commission basis.[37] NDU Press is also, of course, one of the most important military publishers in China.

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[30] Ibid.

[31] Ibid.

[32] Michael Pillsbury, "Chinese Views of Future War," in James R. Lilley and David Shambaugh, eds., *China's Military Faces the Future*, Armonk, NY: M.E. Sharpe, 1999, pp. 66-68.

[33] Ibid.

[34] *Xinhua,* 27 January 1999.

[35] See "China National Defense University: Cradle of Generals."

[36] The author wishes to thank Cynthia Watson and Bud Cole for this information.

[37] "Unify Hearts and Minds of the Army Under the Banner of Deng Xiaoping Thought: Basic Experience of Deng Xiaoping Theory Study by Cadres Ranking at and Above the Regiment Level in the Whole Army and the Armed Police Force," *Qiushi,* No. 21, translated in FBIS-CHI, 1 November 1998.

Development of Graduate Courses

Another important innovation that distinguishes the current PME from the past has been the creation of graduate programs at military academies. The PLA began to develop graduate studies in the mid 1980s when a small number of academies were granted permission to begin building master's programs. Since the authorization for military academies to grant graduate degrees was given, the program has expanded and the number of military academies allowed to grant advanced degrees has steadily increased. According to one Xinhua release in 1999, some 34 military academies were allowed to grant doctorates and 65 academies offered master's degrees.[38] The same source indicated that some 18,000 graduate degrees had been awarded by military academies up to 1990 and that 1999 was going to see the largest increase in military science degrees awarded since1986.[39]

The development of graduate programs reflects a number of improvements in PLA modernization. The increasing complexity of military technology makes advanced degrees an absolute necessity. More than half of USAF officers now have some graduate education.[40] Graduate degrees are also important in non-technological areas. Military officers need a much greater range of knowledge skills than ever before. In part, this reflects changing security concerns such as terrorism or the viewpoint of some that environmental damage is a new kind of security threat. It reflects the recognition that officers need to be effective managers of human and economic resources. It reflects the fact that the armed forces in many countries are being called upon to take up new tasks such as peacekeeping. Most important of all it reflects the need for armed forces to engage in intellectual debate about the changing nature of war and threats. Ideally PME serves as a laboratory for new ideas and generates debate about aspects of the military. Graduate courses and research are an essential part of that process.

To this end, the PLA has produced an enormous amount of literature on military matters since the creation of these graduate programs. Research has covered topics as diverse as the RMA, military law, history, strategy, military economics, psychology, and U.S. policy towards the Korean peninsula. In addition to the formal network of military academies, the PLA has fostered the creation of a number of societies to promote academic research. Two of the newest societies are the China Society of Military Sciences and the Sunzi Society.[41]

Some of this military research is, however, of questionable value. An article in *Qiushi* noted, for example, that some 48,000 articles and 1,600 monographs had been published on Deng Xiaoping Thought by the PLA.[42] While political study is a normal

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The same source also notes that the GPD has reserved some time on channel seven of China Central Television to further promote knowledge of technology.

[38] *Xinhua,*21 January 1999

[39] Ibid.

[40] "Intellectual Military Calls for Scholar-Generals," *Jiefangjun bao,* 2 February 1999, translated in FBIS-CHI, 2 February 1999.

[41] For information of the first executive meeting of this society see "Work Report of the First Executive Council of the China Society of Military Sciences," *Zhongguo junshi kexue*, translated in FBIS-CHI, 20 June 2000.

[42] See "Unify Hearts and Minds."

part of the PLA and does not necessarily detract from military preparedness, writing 48,000 articles does strike this analyst as an excessive waste of time and effort that might better have been applied elsewhere.

Another questionable practice is the tendency of military academies to hire their own Ph.D. and master's students. Very few Ph.D.s are brought in from civilian institutions. This prevents the introduction of new ideas and perspectives, and reduces the quality of debate within military academies. It also tends to reinforce and perpetuate bad research and ideas within the PME system. It is difficult to assess therefore, just how competent these Ph.D. actually are.

Nevertheless, for the first time, the PLA has its own experts on a wide variety of issues including foreign policy. This will allow the PLA to better assess the technical, political and social issues that affect its mission. It also provides a basis for a more active input on national security policy.

Foreign Academic Exchange

Academic exchanges and other contacts between the PLA and foreign armed forces offer additional opportunities to improve PME, and since the 1980s the PLA has actively developed contacts with other militaries. There is an intense interest in foreign militaries among PLA officers. PLA journals and books, for example, devote a fair amount of space to the study of other armed forces. As one measure of the degree of interest in foreign military practice, this author found it much easier in 1992 to find Chinese translations of writings by Rommel, Patton and other Western generals than it was to get the latest book on Dengist thought and army building.

Contact with foreign officers is especially important for developing ideas as to how to improve PME. Part of the contemporary debate on teaching methods and discussions of the "intellectual military" (see below) are driven by what members of the PLA have observed of Western PME. As noted above, NDU plays a central role in fostering these exchanges between the PLA and other militaries, though other institutions are also involved. Since 1991, the PLA has sent over 20,000 people involving more than 800 delegations overseas on inspection tours, research trips and to participate in studies in some 20 countries.[43] Several thousand foreign military personnel have visited China.[44] The bulk of these exchanges have taken the form of inspection tours, but increasing numbers of PLA personnel are now engaging in study abroad and/or participating in fellowship programs. So far most of the officers participating in these kinds of exchanges are from the ground forces[45] and it remains to be seen how far the PLA will go in sending personnel overseas for extended periods of study. The recent alleged defection by a PLA senior colonel may act as a damper on such activity, at least for the near future.

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[43] Kenneth W. Allen, "Showing the Red Flag; The PLA Navy as an Instrument of China's Foreign Military Relations," unpublished paper, p. 4. See also "Army Officers to Study Abroad," *China Daily*, 12 March 2002.

[44] Allen, "Showing the Red Flag," p. 4.

[45] Ibid. pp. 15-17.

Teaching and Other Classroom Issues

In terms of sheer numbers the PLA appears to have done a remarkable job in increasing the education level of its officer corps. As noted above, only 1.2% of officers at the army level had a college level education in 1982. Among divisional level cadres, only 1.6% had a college level education. [46] By 1987, however, 61% of army level and 70% of division level cadres had attained a college level education.[47] In 1993 the PLA claimed that it had trained some 600,000 in "modern military theory."[48] The situation continued to improve in the 1990s. At the end of 2000 the *China Daily* reported that the PLA had 26,000 officers with a master's degree or doctorate and that about 71.8% of officers have studied at institutions of higher learning, up from 42.3% in the early 1980s.[49] Somewhat different figures were offered in a 1998 *Jiefangjun Bao* article, which stated that 56.5% of all cadres held some sort of college qualification, including 90% of cadres at the regimental level and above.[50]

These numbers, however, indicate little about the quality and content of that education. Closer examination of teaching in Chinese military academies reveals that there have been major efforts to upgrade course content and teaching but that serious problems remain. The Chinese made several changes in PME curriculum in the 1980s. One important change has been to broaden the focus of technical classes. The pre-Cultural Revolution system was very narrow. For example a naval officer might study navigation or observation and communication but not both. The result was often officers who could fill only one kind of post. This changed in the 1980s, with students more likely to encounter a wide range of subjects in their studies. Greater efforts were made to combine technical and command training.

In addition, new kinds of courses were added to the curriculum of many military academies. Among the new types of subjects offered were: military education theory, military psychology, foreign policy, international relations, basic issues in building Chinese socialism, legal studies, modern management, and computer programming.[51] While this marks a move towards a more Western approach to officer education, which places a strong emphasis on social science courses, evidence indicates that these types of courses represent only a small portion of the current curriculum and that Chinese PME continues to be predominately technical and command training. For example, though the PLA has had military psychology courses in its academies for well over a decade, it is only in 2001 that the PLA's first psychological warfare experts graduated from the Xi'an Political Institute.[52] Legal, managerial, and computer knowledge also appear to be

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[46] "PLA Reviews Military, Civilian Cadre Systems," *Xinhua*, 28 July 1988, translated in FBIS-CHI, 28 July 1998, p. 20.

[47] Ibid.

[48] "PLA Steps to Improve Effectiveness Outlined," *Xinhua,* 29 July 1993, translated in FBIS-CHI, 29 July 1993 , pp. 21-22.

[49] "Army Officers Better Educated," *China Daily*, 12 December 2000, p. 2.

[50] "A Great Military Reform: Roundup of Strategic Changes in our Army Building," *Jiefangjun bao,* 18 December 1998, translated in FBIS-CHI, 18 December 1998.

[51] Xue and Zhang, *Junshi jiaoyu*, p. 403.

[52] "China Trains PLA Psywar Army Officials," *China Daily*, 23 October 2001. The article reported that an office of psychological warfare was not set up until 1999.

limited. It may take another decade or even longer before these "non-martial" education skills become more widespread within PLA military culture.

Another important innovation was the introduction of electronic equipment into the classroom, including the use of computers and electronic simulation. Videos and television programming have also been widely introduced. Obviously, if the educational system is to produce technologically literate officers, it must begin with classroom equipment. Multimedia and computers can also make learning a more proactive and creative experience. While some reports indicate that some academies have done well with the new electronic classroom, certainly there are now some very useful websites. There are also signs, however that much more needs to be done. The *Jiefangjun Bao* reported that 54 military academies by 1998 had completed campus computer networks.[53] If this figure is correct then only about half of the PLA's military academies have functioning computer networks, well short of what is needed. Nevertheless, there is some anecdotal evidence to suggest that a revolution from below in terms of computer education is occurring and that new officers are very good in information technology and understand the potential for computers in both education and in the field, though it will take at least 10-15 years for a true computer culture to develop in the PLA.[54]

The PLA has also actively encouraged a move away from traditional "passive learning" characterized by students merely listening to the professors. "Active learning" has been encouraged, as has debate, creativity, innovation and spontaneity. One Xinhua release quoted Major General Zhang Xingye, vice president of NDU, calling for less dogmatic teaching and allowing students greater creativity in the learning process.[55] Superintendent Guo Anhua of the Army Command College has also endorsed the need for innovative thinking in military graduates and in teaching.[56] Problems identified in PME by Guo included too much emphasis on lecturing and passive learning, lack of innovation and creativity, weakness in self-study, the need to develop the concept of teaching as a profession within military academies and, the need to stimulate active learning, foster greater debate and create a more relaxed learning environment. Guo clearly developed many of his ideas on changing teaching from his observations from the 11 American military schools he visited in 1998.[57] It is a very laudable focus on the importance of pedagogy, and the call to make teaching a profession is especially noteworthy.

The problem is that Guo and Zhang are not saying anything new. All the issues raised in the previous paragraph have been around in Chinese discussions of PME since the early 1980s. This is a strong indicator that not much has changed in teaching styles over the past 20 or so years. Anecdotal evidence from Western observers tends to

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[53] "Running Schools and Cultivating People of Ability to Consolidate the Great Wall; Fifth Roundup of Army Building Achievements in the Past 50 years," *Jiefangjun bao,* 15 September 1999, translated in FBIS-CHI, 15 September 1999.

[54] The author would like to thank James Mulvenon for his information on the computer skills of the PLA's youngest officers.

[55] *Xinhua,* 27 January 1999, translated in FBIS-CHI, 27 January 1999.

[56] "Major Reform of the Concept of Military Education: Guo Anhua Discusses Questions of Carrying Out Innovative Education," *Jiefangjun bao,* translated in FBIS-CHI, 1999.

[57] Ibid.

confirm this impression.[58] As anyone who has ever been involved in educational reform in universities knows, discussion of improved teaching does not equal actual implementation. The types of changes in teaching styles that are being discussed really require fundamental changes in organizational culture. This is not to say that these innovations are not possible, simply that they will take a very long time to implement.

Not surprisingly, even with more than a decade of effort to improve both education and training the PLA continues to have problems with the assimilation of new technology, equipment, and ideas. One long time observer of the PLA has argued that while the PLA now has the educated officers it needs and they know all the right "buzzwords," their actual understanding of military theory and new issues is actually quite shallow.[59] One article that appeared in 1993 is quite telling. In discussing one of the navy's new destroyers, the *Jiefangjun Bao* stated that officers and men loved the new ship but were also afraid of the new technology. "Traditions, habits, and inertia played a negative role in their attitude toward the new equipment. Some people would not say that they did not know how to operate it, but said, 'the new equipment is useless.'"[60]

One reason that new technology is not being readily absorbed is that weaponry and equipment at the academies have not kept pace with the latest military hardware being deployed with the troops.[61] Thus the military academies that are supposed to be educating are actually technologically behind the actual combat units, at least in some cases. A much bigger problem though is the shortage of fully qualified teaching staff. A *Jiefangjun Bao* article revealed that at the end of the century only 15% of Chinese instructors had a master's degree or higher (as opposed to Russian military academies were the figure was 50% and American military academies were the figure is closer to 90%).[62]

With over 100 academies and low pay, it is very difficult to attract the best qualified instructors. Better opportunities exist elsewhere. Some press reports indicate that military academies do a very poor job of screening job applicants.[63] This implies that some schools are lowering their standards in order to hire staff. There is also evidence that many academies are having trouble retaining those they do hire. A survey in 1993 indicated that 72% of young instructors in the academies were preparing to "jump into the sea," a euphemism for leaving the PLA to join the private sector.[64] Poor pay and better opportunities elsewhere were driving good instructors away. Those instructors who

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[58] This information is based on conversations with Paul Godwin, Bud Cole, Cynthia Watson, and David Shambaugh

[59] June Teufel Dreyer, "The New Officer Corps: Implications for the Future," *China Quarterly*, June 1996, pp. 322-323.

[60] "Problems in Assimilating New Equipment Noted," *Jiefangjun bao,* 12 August 1993, translated in FBIS-CHI, 12 August 1993, p. 20.

[61] "Education Reform: Step Taken Towards Intellectual Military," *Jiefangjun bao,* 2 March 1999, translated in FBIS-CHI, 2 March 1999.

[62] Ibid.

[63] "Blueprint for Reform of Military Academies, 2000-2010," *Jiefangjun bao,* Internet version, 25 April 2000.

[64] "Army Teachers' Views of Second Occupations," *Jiefangjun bao,* 19 February 1993, translated in FBIS-CHI, 19 February 1993, pp. 24-26.

did not move often resorted to moonlighting. Morale was generally low. The PLA could recruit more instructors from its better field commanders, but the problem is that, unlike many western armies, once an officer has become an instructor s/he is likely to remain an instructor for the rest of their career. There is little movement between command and teaching duties though recent interviews indicate that some instructors are doing 1-2 year stints as a deputy in units and headquarters in the field. This is a serious omission. It slows dissemination of new doctrine from the schools to the field. Instructors can more effectively propagate their ideas if they spend time in command positions. There are therefore, some serious obstacles to further improvement in officer education. On the other hand, there is also increased focus on the importance of PME in the past few years and new initiatives may be able to address some of these problems.

Increased Emphasis on the Importance of PME

Since the early 1990s there has been a gradual but noticeable increase in the emphasis placed on the importance of PME. Jiang Zemin has made PME an important part of his push for greater regularization and improvement of the PLA and has made a point of visiting NDU no less than 11 times between 1992 and 1998. Other members of the CMC have been even more frequent in their visits.[65] The PLA press has stepped up articles on the importance of scholar-generals and a better educated military. These articles have been careful to point out that practical experience from the past is no longer sufficient and that future wars will be won or lost based on the educational and technical accomplishments of military leaders. As one *Jiefangjun Bao* article put it, "an army without education is a stupid army and unlikely to overcome the enemy."[66]

Part of this greater appreciation of the importance of PME comes from observed practice in other armies. The *Jiefangjun Bao* has noted, for example, that the Australian army requires officers to be able to speak at least one of ten different Asian languages to gain promotion to the rank of major and that the Japanese require all their officers to have at least some schooling beyond the college level.[67] The article then went on to note that 98% of Russian officers had received some form of higher education, and that 38% of American military officers had a master's or Ph.D. and more than half of all USAF officers have attended some graduate school.[68] If the PLA is to compete with these potential rivals, the article argued, it must follow suit.

A second factor that has helped push PME to the fore is the sense that despite the amount of progress achieved so far, the PLA is in danger of falling further behind. The Gulf War of 1991, the conflict in Kosovo, and Operation ENDURING FREEDOM in Afghanistan have demonstrated the effectiveness of modern technology. To be able to fight in such high tech local wars the PLA will have to upgrade the quality of its military

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[65] "China National Defense University: Cradle of Generals," *Kuang chiao ching,* translated in FBIS-CHI, 16 December 1998.

[66] "Intellectual Military Calls for Scholar-Generals," *Jiefangjun bao,* 2 February 1999, translated in FBIS-CHI, 2 February 1999.

[67] Ibid.

[68] Ibid.

education with even further emphasis on technically skilled personnel.[69] There is a real sense that the key to winning future conflicts rests as much in superior technical knowledge as any other factor. Closely related to this is a greater appreciation of the pace of change in all aspects of technological change, including the military. One factoid that is often cited in the Chinese military press is that the life cycle of knowledge has gone from twenty-five years to three years[70] and that steps must be taken correspondingly to keep officers abreast of the latest changes. The PLA will be stepping up the delivery of new weapons systems over the next ten years and officers will have to be ready.[71] In other words the quality of PME is an even more pressing issue than when Deng Xiaoping raised his concerns at the end of the 1970s.

The CMC has set some ambitious plans for the next ten years including the goal of having at least 10 military academies up to advanced national levels by 2010 and that the proportion of army level commanders with a high level of education should exceed that of officers at the regimental and divisional levels.[72] Three initiatives in particular are worth noting: the reorganization of military academies, the introduction of new regulations to better govern PME, and the effort to involve civilian universities in PME.

Reorganization and Consolidation of Military Academies. A major problem with the educational system in the PLA is that there are too many academies, even for an army as large as the PLA. Many are highly specialized and have small enrollments. Consequently, relatively scarce funds are wasted keeping open small schools when it may be more cost effective to have activities concentrated in a smaller number of academies. It might be better, and less expensive, to have 20 to 40 good libraries than 100 poor ones. Similarly it might be easier to update computer facilities if there were fewer campuses to wire. The large number of schools means that the relatively small pool of teaching talent is also stretched thin which keeps the quality of teaching low. Fewer schools would also make it easier to provide officers with a more comprehensive education.

In the summer of 1999, the Chinese military began a program of adjustment and reform of military academies. The reform has been primarily aimed at reducing the number of single purpose academies and rationalizing the structure. It sought to enlarge the remaining academies in terms of students, thereby achieving some economy of scale and reducing unnecessary duplication of some functions and courses.

One part of the new PME reorganization has been the creation in 1999 of a new University of Science and Technology for National Defense, formed from the merger of four military academies in Changsha and directly under the leadership of the CMC.[73] Another new university is the PLA Information Engineering University established in July 1999. This new university was created by merging the PLA Zhengzhou Information Engineering College, the PLA Electronic Technology College, and the PLA Topography

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[69] See for example, "Hi-Tech Local Wars' Basic Requirements for Army Building," *Zhongguo junshi kexue,* No. 4, translated in FBIS-CHI, 20 November 1998.

[70] See "Education Reform: Step taken Towards Intellectual Military."

[71] See "Blueprint for Reform of Military Academies, 2000-2010."

[72] "Central Military Commission Issues Program for Educational Reform and Development of Military Academies," *Jiefangjun bao,* 15 April 2000.

[73] *Xinhua*, 18 June 1999.

College.[74] The new school is able to provide a more comprehensive educational framework and has a reported 10,000 students and staff. The PLA apparently believes that the more comprehensive framework of the university will better provide it with future information warfare experts. At least three other major reorganizations took place among ground force academies in 1999. The Shijiazhuang Army Command School was created by merging the Army Staff Institute and the Armored Forces Command Academy. The new PLA Science and Engineering University was established by combining the Institute of Communications Engineering, the Engineering Institute of the Engineering Corps, the Meteorology Institute of the Air Force, and the General Staff Department's (GSD) No. 63 Research Institute. Finally, the Artillery Corps Institute was formed by combining the Hefei Institute of Artillery and the Nanjing Institute of Artillery.[75] All these schools offer a range of courses from graduate to doctoral levels. All of the mergers were aimed at reducing inefficiencies and creating broader courses from integrating the missions of the constituent schools. All are expected to significantly increase their enrollments.[76]

The PLAN and PLAAF have also been reorganizing and each has set up a "comprehensive" university.   In 1999, the PLAN set up its first comprehensive university in Wuhan, the Engineering University of the Navy, formed by merging the Navy Engineering Academy and the Electronic Academy of the Navy. It became the fifth comprehensive university in the PLA. The new university is said to have 25 master's programs, 8 doctoral programs and 2 post-doc programs.[77] The school will combine command and engineering training and marks a further attempt to get a way from traditional practices of single subject schools and narrow specialization in education. The PLAAF's first comprehensive university has been formed by merging the Air Force Engineering Institute, Missile Institute, and Telecommunications Institute to form the China Air Force Engineering University.[78] This last merger, however, is administrative only, as the schools continue to exist as separate units.[79] Further consolidation and reorganization is being planned among all the services though it remains to be seen how much is genuine and how much is merely cosmetic.

PME Regulations. In addition to reorganization, the PLA has, since 1998, issued several new sets of regulations dealing with the military academies. This is part of a larger process in the 1990s to develop a legal code and a comprehensive set of regulations. These regulations for the first time create clear guidelines for many educational activities.   These new regulations should reinforce many of the educational reforms already taken and deal with some of the shortcomings discussed above.

In December 1998, the military service law was amended to include, among other issues, regulations regarding education of officers and recruitment of personnel from outside the military. Specifically, the revised regulations provide for the direct

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[74] *Xinhua,* 2 July 1999.
[75] Ibid.
[76] Ibid.
[77] *Xinhua,* 17 June 1999.
[78] *Xinhua*, 23 July 1999.
[79] The author would like to thank Ken Allen for this information.

recruitment from civilian universities (bolstering the new policy of recruiting college graduates) and provide guidelines for dealing with those students at military academies who are not up to standard, including the issue of dismissal.[80] Parts of these changes simply regularize new recruitment policies. But it is significant that the new regulations deal with the issue of students who fail to meet standards. There is evidence that many officers are passing courses when they should not be, and that exams and standards are not rigorously enforced.[81] Now there are at least some guidelines.

In 1999, the CMC began the process of institutionalizing a program of continuous officer education and the creation of appropriate regulations.[82] This too addresses an important gap in PME. As the pace of technological change accelerates officers need to upgrade their knowledge more frequently, it is no longer sufficient for select officers to go back to academies as they get promoted. All officers need some refresher education if they are to adequately fulfill their duties.

At the beginning of 2000 the PLA finally published a full set of regulations for military academies, replacing the provisional PME regulations promulgated in 1987. Consisting of 13 chapters and 92 articles, the new regulations finally create a concrete legal basis for regularizing and standardizing PME in China. Among other things, they define the scope of military education, academic standards, time required to reach certain qualifications, as well as duties of school administrators and departments.[83] While the adoption of these regulations is a very significant step forward (on paper at least) one cannot help but notice that such basic elements as academic standards and administrative duties have not been clearly defined until 2000, over fifty years after the foundation of the PLA's military education system. That is a remarkably long time to achieve such a basic level of institutionalization.

The official regulations on military academies were quickly followed up by a new set of provisional regulations that for the first time provide guidelines for leading cadres at military academies. [84] These new guidelines stress good political qualities, management skills and academic achievement. Interestingly, the regulations also call for a balanced age structure in military academies between old, middle and young cadres. The regulations also encourage the selection of new teachers from returned students and graduates of civilian universities as well as creating an accreditation for academic cadres at the military region level.[85] The regulations further call for reexamination of cadre qualifications when their term of office has run out. Apparently this is the first time that a regular process has been created to get rid of instructors for inadequate <u>professional</u> qualifications.   One final noteworthy aspect of the new provisional regulations is that

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[80] "Military Service Law of the People's Republic of China," *Xinhua,* 30 December 1998, translated in FBIS-CHI, 20 December 1998.

[81] Dreyer, "New Officers," p. 321.

[82] *Xinhua,* 9 July 1999, translated in FBIS-CHI, 9 July 1999.

[83] *Xinhua*, 28 February 2000, translated in FBIS-CHI, 28 February 2000.

[84] "PLA General Political Department Issues 'Provisional Regulations on a Number of Problems Concerning the Building of Cadre Contingents in Military Academies and Institutions," *Jiefangjun bao,* 10 August 2000, translated in FBIS-CHI, 10 August 2000.

[85] Ibid.; and "PLA General Staff Promulgates Regularization in Teaching Positions," *Jiefangjun bao*, Internet edition, 29 September 2000.

they create prizes to be awarded to those instructors and staff that make contributions towards better teaching. While it is too early too evaluate the effectiveness of these changes, all of which are aimed at improving instruction, they do indicate a significant increase in efforts to develop better teaching in military academies.

Role of Civilian Colleges. While the new regulations may improve the quality of teaching in the future, there is still the question of how to produce high quality officers now. This is especially true with regards to officers requiring highly technical backgrounds, and it is in hi-tech areas that the limitations of military academic staff are most apparent. The PLA has responded to this problem by turning to civilian universities, presumably in the hopes of attracting better quality cadets.

The Second Artillery, for example, has recruited some 1,600 college students since 1994.[86] The PLAN has recruited some 2,700 officers from civilian universities between 1993 and 1998[87] and there are plans to have recruits from non-military schools make up about 40% of all naval officers by 2010.[88] The PLAN in particular has been interested in creating an equivalent of the U.S. Navy's highly successful ROTC system, especially after Taiwan adopted the system.[89] As of the year 2000, the policy of recruiting military cadres at civilian universities has expanded to 22 regular colleges in China,[90] even providing scholarships in some cases as a recruiting device.[91]

Overall the PLA has recruited 46,000 university graduates from non-military academies since 1992 and a joint resolution of the CMC and the State Council said that the army would rely on civilian institutions of higher learning to foster officers.[92] More broadly, some see the need for greater cooperation between civilian and military colleges and universities, arguing that future economic growth will be a function of knowledge productivity and that civilian and military colleges should be turned into "knowledge factories." [93] Chinese military academies are, therefore, supposed to be participating in

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[86] "Training New Missile Troops," *Jiefangjun bao,* 26 December 1999, translated in FBIS-CHI, 26 December 1999.

[87] Ibid.

[88] *Xinhua,* 17 August 1999, translated in FBIS-CHI, 17 August 1999.

[89] Bernard Cole, "The Organization of the People's Liberation Army Navy," in James Mulvenon and Andrew N.D. Yang, eds., *The People's Liberation Army as Organization: Reference Volume v1.0*, Santa Monica, CA: RAND, CF-182-NSRD, 2002; and "Taiwan's First ROTC Cadets," *Taipei Times*, Internet version, 22 November 2000.

[90] *Xinhua,* 22 June 2000, translated in FBIS-CHI, 22 June 2000.

[91] "China Vows to Build a Modern Army," in *China Daily*, 1 August 2001. The PLA helped to pay for the college education of some 2000 personnel in 1999-2000. In turn, the students took time off from college to serve a stint in the PLA and had their student status saved for them when they finished their tour of duty.

[92] "Army Better Educated," *China Daily*, 12 December 2000.

[93] See "Education Reform: Step Taken Towards Intellectual Military" Among other things, the article claimed that people with college educations could improve their productivity by as much as 300% as opposed to only 43% for those with a primary education. Regardless of the accuracy of these figures they give some indication of current elite thinking.

the overall plan to build world-class universities throughout China as part of economic growth in the 21st century.[94]

In turning to civilian universities, the PLA is following a practice seen in many countries. Most Western militaries rely in part on civilian education, especially in more technical areas. The new policy should provide the PLA with better educated officers, as the quality of science and engineering education does appear to be better in the civilian education system. The question that cannot be answered at present is how many of these college graduates will stay in the PLA. Retention rates will be the key to the success of this particular reform but it is difficult to see at this point how the PLA will provide the economic incentives to keep many of these new recruits.

ASSESSMENT AND CONCLUSION

In many respects the PLA has made significant progress in PME since 1980. There has been genuine reform and improvement in the education system and the officer corps is more professionally qualified. The level of educational attainment among officers is considerably better than it was 20 years ago. True, PLA officers are not as well educated as they could be and they still are behind their counterparts in the United States, but the gap has closed somewhat.

Overall, the structure of PME has improved. The system is less specialized than before. Academies are now more comprehensive and NDU serves as an all-inclusive apex of the educational system. Additional consolidations should further this trend. Educational content has also improved to some extent. Officer education is less specialized and officers are exposed to a greater variety of command and technical courses. This means that graduates are able to perform in a greater variety of posts than in the past. Courses now cover non-military subjects, reflecting an understanding that officers need a wide variety of skills if they are to be effective managers. Simply understanding combat operations is no longer sufficient. Military exchanges have further broadened the perspectives of many PLA officers.

PME also enjoys a greater priority than in the past and the PLA is finally going through the process of regularizing its educational system, providing the necessary foundation for further development. However, the fact that these changes are coming so late is an indication that further progress will be slow. There is more concern with the quality of teaching and teaching methodology. The policy of sending officers to civilian universities and recruiting more college graduates should also raise officer standards.

However, many problems still remain. PME remains insufficiently funded. Despite the recent consolidations, PME still involves a large number of institutions resulting in insufficient resources to keep all facilities current with equipment and educational resources. Academies have trouble recruiting and retaining qualified personnel, and despite the concern over teaching, some sources indicate that the quality of teaching has actually declined.[95] One source even indicated that while educational levels have improved for officers at the regimental level and above, the educational level

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[94] "Vigorously Implement the Program of Action and Strive to Build a First Class University," *Guangming ribao,* 15 March 1999.

[95] "Ten Major Perils in the Chinese Army," *Cheng ming*, 1 August 2000.

of platoon leaders is lower now than in 1980.[96] There are questions of form versus substance. On paper, the PLA has made many important changes, yet as the material presented above indicates, it is uncertain how well these changes have been implemented. To what extent has course content and teaching really improved? Are the seminars at NDU genuine seminars or is passive learning still the norm? Reforms aimed at improving assessment and accountability in PME are still in their infancy. The PLA is addressing these issues but it is too early to tell how effective these efforts will be.

Overall, the direction of efforts to improve PME has moved the PLA's educational system more in the direction of Western practice. There has been a definite (but incomplete) movement away from a narrow, technical concept of professional education that includes political indoctrination, towards a concept of professionalism that is broader and more in keeping with western concepts   However, as Cynthia Watson has pointed out, the PLA cannot achieve success simply by copying.   American PME, which is a product of over 100 years of experience and is still evolving, cannot be transferred wholesale to another military culture and produce instant results. Education in the U.S. military, for example, has been joint in every sense of the word since 1946. The PLA has had joint service education for only a few years and then only in a limited way at one academy. It will take many years of practice and experimentation for the PLA to absorb these changes and derive the benefits of a more Western-style PME.[97]

This raises a point that is extremely familiar to students of civil-military relations. According to Huntington, soldiers become more professional as they become less political. I do not wish to go into the whole debate on Chinese civil-military relations here. I simply wish to point out that the character of political education in the PLA is worth watching. While political courses appear to still take up 20-30% of class time, the content of political education has changed. As the party has jettisoned many aspects of Marxism, political education is now less about the nature and content of Marxism and mostly about loyalty to the party.[98] By all accounts these courses are highly unpopular with cadets.[99] There is an important "disconnect" here and how the notion of loyalty to the party evolves among military students will be important. Connected to this issue is the problem of ethics. As is well known, the PLA has a problem with corruption. Ethics and codes of conduct are a part of PME in many countries. The problem for China is that ethics is tied up with political education. If cadets are not listening in their political classes, then they are not getting the message about ethics either. How the PLA handles this aspect of PME in the future bears watching.

In sum, what the PLA has created are the beginnings of a solid and well developed PME system. The next ten years will determine whether or not they can consolidate and build on that beginning.

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[96] "A Discussion of Reform and Development of Military Academies and Development Oriented Toward the New Century," *Zhongguo junshi kexue,* No. 1, translated in FBIS-CHI, 20 February 1999.

[97] The author would like to thank Cynthia Watson for these ideas.

[98] James C. Mulvenon, *Professionalization of the Senior Chinese Officer Corps*, Santa Monica, CA: RAND, MR-901-OSD, 1997, p. 22.

[99] June Dreyer, "New Officers," p. 319. Most western sources put the time on political education between 20 to 30 per cent since the early 1980s.

APPENDIX: CHINESE MILITARY ACADEMIES (AS OF FALL 2000)

PLA Academies and Research Institutes Directly Under the CMC
      PLA National Defense University
      Academy of Military Science
      National Defense Science and Technology University (Changsha)

General Political Department Academies
      PLA Art Academy
      Nanjing Political Academy
      Xi'an Political Academy

General Armaments Department Academies
      Armament Command and Technical Academy (Huairou)
      Armored Force Engineering Academy (Beijing)
      Armored Force Technical Academy (Changchun)
      Ordinance Engineering Academy (Shijiazhuang)

General Staff Department and Ground Force Academies
      Anti-Chemical Warfare and Engineering Academy (Beijing)
      Army Aviation Corps Academy (Beijing)
      Army Command Academy (Shijiazhuang)
      Army Staff Academy (Guangzhou)
      Army Guided Missile Academy (Langfang)
      Armored Force Academy (Bengbu)
      Armored Force Academy (Hunan)
      Artillery Academy (Hefei)
      Artillery Command Academy (Zhangjiakou)
      Artillery Academy (Shenyang)
      Communications Academy (Chongqing)
      Communications Command Academy (Wuhan)
      Electronic Engineering Academy (Hefei)
      Engineer Corps Command Academy (Xuzhou)
      Foreign Languages Academy (Luoyang)
      Information Engineering University (Zhengzhou)
      International Relations Academy (Nanjing)
      Nanjing Army Command Academy
      Shijiazhuang Army Command Academy
      In addition, each Military Region has its own Army Command College.

General Logistics Department Academies
    Logistics Command Academy (Beijing)
    Logistics Engineering Academy (Chongqing)
    Logistics Management and Technology Academy (Xuzhou)
    Military Economics Institute (Wuhan)
    Military Medical Sciences Academy (Beijing)
    First Medical Military University (Guangzhou)
    Second Medical Military University (Shanghai)
    Third Medical Military University (Chongqing)
    Fourth Medical Military University (Xi'an)
    Military Supplies University (Changchun)
    Science and Engineering University (Nanjing)
    Sports Academy
    PLA Transportation Engineering Academy (Tianjin)

PAP Academies
    Academy of the Chinese People's Armed Police (Lanfang)
    Command College of Chinese People's Armed Police (Tianjin)
    Xi'an Command College of the People's Armed Police (Xi'an)
    Engineering Academy of the People's Armed Police (Xi'an)
    Medical College of Chinese People's Armed Police
    Special Police School

PLAN Academies
    Navy Command Academy (Nanjing)
    Navy Submarine Academy (Qingdao)
    Dalian Naval Vessels Academy (Dalian)
    Guangzhou Naval Vessels Academy (Guangzhou)
    Navy Aviation Academy (Huludao)
    Navy Engineering University (Wuhan)
    Navy Aeronautics Engineering Academy (Yantai)
    Navy Aeronautics Technical Academy (Qingdao)

PLAAF Academies
    Airborne Force Academy (Kaifeng)
    Air Defense Force Academy (Zhengzhou)
    Air Force Command Academy (Beijing)
    Air Force Academy (Guilin)
    Air Engineering University (Xi'an)
    Air Force Logistics Academy
    Air Force First Aeronautics Academy (Xinyang)
    Air Force Second Aeronautics Academy (Changchun)
    Air Force First Aviation Academy (Harbin)
    Air Force Second Aviation Academy (Jiajing)

Air Force Third Aviation Academy (Shenyang)
Air Force Fourth Aviation Academy (Shijiazhuang)
Air Force Fifth Aviation Academy (Lanzhou)
Air Force Sixth Aviation Academy (Dingxing)
Air Force Seventh Aviation Academy (Changchun)
Air Force Radar School (Wuhan)

Second Artillery Academies
Second Artillery Corps Command Academy (Wuhan)
Second Artillery Engineering Academy (Xi'an)
Second Artillery NCO School (Qingzhou)
Second Artillery Technical Academy
Second Artillery Missile Forces Academy (Xi'an)

Other Academic Organizations
China Institute for International Strategic Studies (Beijing)
Shanghai Institute for International Strategic Studies
Military Museum of the Chinese People's Revolution (Beijing)
Air Force Aviation Museum
Naval Museum
Chinese Society of Military Sciences
China Society for Military Dialectics
Beijing Military Law Society
China Society of Military Future Studies
China Foundation for International and Strategic Studies (Beijing)

(Sources: *Directory of PRC Personalities*, October 2000, and David Shambaugh, *Modernizing China's Military: Progress, Problems and Prospects,* Berkeley, CA: University of California Press, 2003)
Note: some information may no longer be current.

2.   THE CHINESE SPACE PROGRAM: A 21ST CENTURY "FLEET IN BEING"?

By Dean Cheng

INTRODUCTION

Since the end of the Gulf War, the PRC has devoted significant resources to considerations of the state of future warfare. In the wake of "Desert Fox" and the NATO intervention in Kosovo, those considerations have tended to focus more and more on the prospect of conflict with the United States. In this context, space operations become essential.

On the one hand, the United States and Western forces utilize space-based assets to perform many key functions, including reconnaissance, surveillance, and missile early warning. In the event of any future conflict, the U.S. and its allies would presumably be intent upon both exploiting space for their own purposes, while denying its use to the PRC. At the same time, the PRC has a well-developed space capability that gives it a distinct advantage over Taiwan and separates it from most other Asian powers. Thus, the PRC has a growing interest in maintaining its own access to space. Moreover, the Chinese economy has benefited greatly from the commercial use of space, and would be affected by any interference in its ability to access space-based operations.

This paper will examine how the Chinese view space in the context of future warfare. It will begin with an examination of the Chinese view of future warfare, and how space systems fit into that view. It will then examine the Chinese space program, focusing on its capabilities. It will then assess likely Chinese approaches towards space, given its doctrinal views and space capabilities.

CHINESE CONCEPTIONS OF FUTURE WARFARE

The PRC view of future warfare, at this point, appears to have reached a certain level of consensus at the strategic and operational levels. That is, the PRC appears to have concluded who its opponents will be, and, in the main, how their forces will confront China. At the strategic level, broadly speaking, there appears to be a consensus among PRC military writers that:

> Politically, the future will be driven by hegemonic powers intent on dominating the world. These nations will not only be motivated by power and the desire for control, but will also have access to significant economic, technological, and political resources, likely in excess of that available to the PRC.

These forces, in turn, will view the PRC as a threat, as Beijing will not acquiesce in their goal of global domination. The need to curtail PRC defiance, coupled with a general desire to brook no argument from potential challengers, means that the likelihood of future conflict is very high. There is little discussion of how or why such conflict might be avoided, suggesting that this may be a foregone conclusion.

These hegemonic forces will generally utilize terms such as "humanitarian" concerns or "human rights" to justify their aggression. This might be expressed as concern about the "rights" of groups such as the Taiwanese or the Tibetans, as was seen in Kosovo.

The most important of these hegemonic forces confronting the PRC, of course, is the United States. As the world's sole superpower, the United States appears to have arrogated to itself the right to intervene everywhere, the importance of "national sovereignty" and the right to be left alone, or to self-determination of "internal affairs" notwithstanding. However, other states that are also likely to entertain ill-will towards the PRC includes Japan, which has its own interests, separate from those of the United States.

While the United States may be the sole superpower, however, it tends to rely upon alliances and coalitions when prosecuting conflicts, both in order to spread the burden of conflict and to intimidate its opponents. This effort at creating coalitions, coupled with domestic political uncertainty, means that while the United States may be militarily and technologically stronger than the PRC, it also operates under distinct constraints. Perhaps most important is that, in order to minimize the potential for contradictions with its allies, the United States and any coalition it leads must seek a prompt victory, with relatively few casualties.

Given these limitations, as well as the evolution of technology since the Sino-Vietnamese War of 1979 and the Falklands War, Beijing has concluded that the United States will seek to undertake limited warfare, aimed at unbalancing an opponent, involving the widespread use of precision strike munitions in conjunction with advanced reconnaissance and information systems, in a modernized version of joint warfare. This new form of limited, high-tech warfare is termed "Local Wars Under High-Tech Conditions." From Beijing's perspective, the Kosovo War is the archetype for future conflict.

Local War Under Modern, High-Tech Conditions, from Beijing's perspective, is qualitatively different from past approaches to conflict. In the first place, it is highly offensive-oriented. Although there will still be a place for defensive operations, the

emphasis will be on seizing and retaining the initiative.[100] This is in sharp contrast to past strategies, including "People's War," "People's War Under Modern Conditions," and even "Local Wars." Remaining on the defensive leads to defeat; indeed, even defensive operations, under this new paradigm, must incorporate offensive actions.[101] This is partly because future conflicts will be decided in just one or two campaigns, which in turn may well be decided by just one or two battles. There is, therefore, at best limited prospect for prolonged conflict to alter the correlation of forces.

At the same time, however, such conflicts will be all-encompassing, despite their limited duration. That is, they will involve operations throughout the range of possible battlegrounds, including not only the traditional air, land, and sea areas, but also in the information realm, and in outer space. Operations in each will affect the outcomes in the others. Moreover, the full depth of the theater is likely to be engaged.

Consequently, in order to undertake such campaigns, commanders must possess:

A. Reconnaissance/surveillance capabilities. That is, they must be able to determine an enemy's situation, geography, and other related combat information

B. Mobile firepower, defined as the ability to undertake rapid, yet ferocious attacks against an opponent, throughout the depth of the theater.

C. Electronic warfare means, both in order to preserve one's own ability to utilize electronics systems, while disrupting an opponent's ability.

D. Command and control capabilities, which can be sustained in combat.

E. Deterrent capabilities, to limit the enemy's responses.

F. The ability to join disparate forces and elements together. Forces from different services and different locations must be able to interact promptly, in a coordinated, mutually supporting manner. [102]

Integral to such capabilities is the utilization of space. Official Chinese military writings note that space is considered the "fourth environment" for military operations, after land, sea, and air, and on par with electronic warfare. Public pronouncements notwithstanding, Chinese military writers clearly recognize that space operations will be a fundamental part of future military operations.[103]

Indeed, Chinese writings suggest that space systems are a key portion of the military's ability to operate in the new environment. They are the main "eyes and ears" of the military world, but they also serve as the "nerves" for enhancing warfare, by facilitating C3 functions. Moreover, space systems help provide the wherewithal for

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[100] Zhou Shiao-yu, et al., *Lianhe zuozhan xinlun,* Beijing: National Defense University Press, 2000, pp. 3-7.

[101] Ibid., p. 143.

[102] *Zhanyixue* [Science of Campaigns], Beijing: National Defense University Press, 2000, pp. 44-48.

[103] Ibid., pp 55-88, 89-92.

precision strike and stealth weaponry.[104] It is even suggested that, in the future, such systems will likely to provide the "hands and feet" of future warfare as well, with powerful space-based weapons, space stations, and the means of actually capturing satellites.[105]

The Role of Space in the Chinese View of Future Warfare
Consequently, the PLA has written at length on the likely mission requirements for effective exploitation of space, including in support of joint operations. Key space missions include:

A.   Determining political, military, economic, communications and other strategic targets of potential enemies.
B.   Tracking the deployment of enemy forces, as well as their compliance with international treaties.
C.   Monitoring enemy forces, to forestall the prospect of surprise attacks.
D.   More tactical intelligence, including battlefield reconnaissance and military meteorology (listed as a separate capability) for both military and political leaders.
E.   Exposing enemy concealment and camouflage, while verifying the effectiveness of one's own Cover, Concealment & Deception (CC&D) capabilities.

Other missions include space-based warfare, interception of ballistic missiles, and in the future might also include strikes against terrestrial targets by space-based systems as well as attacks against space-based platforms by terrestrial forces.[106] PLA assessments of these requirements conclude that the PLA needs to deploy both a space control force and a space information support force.
The space control force would be focused on military missions that directly supported terrestrial operations, including space blockade and space electronic warfare missions.[107] The general aim of space control would be to deny an opponent the ability to use space through both hard- and soft-kill means.[108] Space blockade operations would involve the deployment of space mines or other systems to destroy enemy satellites and other space-related systems. Space EW involves the use of jamming and other means to produce a mission-kill, even if not a hard-kill, disrupting an opponent's ability to communicate with or via their satellites.[109] It is not suggested, however, that the PLA, or

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[104] Zhao Dexi, "It is Necessary to Give Serious Attention to Building a Military Aerospace System to Strengthen National Defense," *Zhongguo hangtian*, November 1998, pp. 6-9, translated in FBIS-CHI, 14 January 1999.
[105] Ibid.
[106] Zhao Yiping and Wang Jiangqi, "Space Warfare Is Certainly Not Far Off," *Guangming ribao,* 28 December 1999, translated in FBIS-CHI, 14 January 2000.
[107] "How Will Space Wars Be Fought?" *Xinhua,* 27 February 2001.
[108] "Space Dominance---the U.S. Hopes to be First," *Jiefangjun bao,* 21 February 2001.
[109] "How Will Space Wars Be Fought?" *Xinhua,* 27 February 2001.

the PRC in general, currently fields the technologies required to undertake the space control mission. Instead, space control operations are discussed only in the most general of terms.

The space information support force would utilize space to garner information, and would be responsible for undertaking observation/reconnaissance missions, global navigational positioning, and communications support.[110] Other roles would include meteorological support and information relay. Such missions, by contrast, can be undertaken by the PLA today.

Reconnaissance. Perhaps the most important mission of space-based platforms is reconnaissance. Space-based sensors, PLA authors note, are not affected by weather or terrain, and have an enormous range of view. They can also maintain a higher level of readiness, at lower cost, than air-breathing systems. Moreover, based on international law, they can overfly an opponent's territory, without violating the law or providing a *casus belli*.[111]

In this regard, the benchmark for Chinese analysts appears to be the United States. Chinese descriptions of the American reconnaissance satellite constellation note its dependability and relative invulnerability, providing the United States with, arguably, the most modern surveillance force in the world.[112] And, they note, the United States is increasingly reliant upon it for its most up-to-date information, with an estimated 80% or more of U.S. military information derived from satellites.[113] With its network of highly capable electro-optical and radar-imaging satellites, U.S. commanders reportedly could determine exactly where to attack, often with what munitions, while avoiding enemy troop concentrations and, reducing casualties. [114] According to Chinese military observers, early deployment of such systems in the Gulf War ensured that the United States retained "its initiative in the war. This played a key role in seizing victory."[115] Similarly, in Kosovo, PLA authors assert that the United States employed a number of systems, including two radar-imaging reconnaissance satellites and three electro-optical imaging satellites.[116] Increasingly, however, Chinese writers are also noting that electronic reconnaissance satellites, which monitor radars, command posts, command frequencies, etc., allow the United States to gain a more precise understanding of the precise composition of the forces confronting them, beyond simply their locations.[117]

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[110] Ping Fan and Li Qi, "A Theoretical Discussion of Several Matters Involved in the Development of Military Space Forces," *Zhongguo junshi kexue,* 20 May 1997, pp. 127-131, translated in FBIS-CHI, 20 May 1997.

[111] Ibid.

[112] "U.S. Photo-Recon Satellites," *Zhongguo hangtian,* No. 9, 2000, pp. 31-38.

[113] Zheng Dedou, "U.S. Space Combat Theory, Structures, and Responsibilities," *Xiandai bingqi,* April 2001, pp. 5-9.

[114] Wang Shiuyi, "American Space Forces in the New Century," *Xiandai bingqi,* April 2001, pp. 2-4

[115] Zhao Shuanlong, "The Initial Battle is the Decisive Battle, and Preparations for Military Struggle in the New Period," *Jiefangjun bao,* 18 August 1998, p. 6, translated in FBIS-CHI-98-257, 14 September 1998.

[116] Wang Shiuyi, pp. 2-4.

[117] She Wenbing, "Discussion on Satellite Combat," *Zhongguo kongjun,* No. 1, 2001, p. 25.

Thus, they assert that the relatively small Operation "Desert Fox" entailed not only five U.S. imaging reconnaissance satellites engaging in four observations per day prior to the operation, but also radar-imaging, and electronic reconnaissance and radar-imaging satellites.[118]

Meteorology. PLA writers understand that weather conditions are a key factor in military operations, particularly amphibious and airborne assaults, such as might be necessary for operations against Taiwan. The surprise experienced by German forces at Normandy resulted, at least in part, from the Allies' ability to forecast a break in the stormy weather from June 6 to June 7. The Germans did not predict this break because their weather forecasting assets in the North Atlantic had been eliminated by the Allies.[119] Meteorological systems also allow commanders to refine their choice of weapons and units to suit the weather conditions of the moment. These measures not only increase the effectiveness of strikes, but also reduce the risk of loss of personnel and equipment. Failure to take such factors into account, which marked the abortive U.S. hostage rescue attempt in October 1980, can lead to critical mission failures.

Command and Control. Satellite-based C3 systems allow for the coordination of military operations across vast distances in real–time or near-real-time, even when they are out of theater. Consequently, forces can be maximally utilized, increasing efficiency for available forces, Chinese authors argue that the resulting C2 structure is also more flexible and responsive, coordinating disparate forces while unhampered by threat of jamming or disruption.[120]

Navigation. The advent of navigational satellites, and especially GPS, is another major contribution of space to modern warfare. Navigational satellites allow forces to move rapidly and precisely, as well as undertake strikes against even distant targets with great accuracy. The integration of satellite navigational systems directly into the weapons, can make them autonomous. Moreover, by alleviating the requirement to transmit information in the process of determining location, both weapons and launching platforms can be much stealthier. As important, navigational satellites also provide time updates, so that maneuvers can be coordinated to the second, even among widely separated forces coming from different locations. All this occurs, moreover, under all-weather conditions, twenty-four hours a day.

Earth-Observation Systems. Another important system is earth-observation or earth-resource satellites. These measure the conditions of the earth, including its gravitational field.[121] This is a vital, if relatively low-profile, mission, since measurements of the earth's gravity and shape are essential in any calculation of aircraft and missile flight-paths, which will, in turn, affect weapon accuracy.[122] If these factors are not taken into account, then weapons accuracy is affected. Chinese writers attribute

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[118] An Maochun and Yu Dongtao, "U.S. Reconnaissance Capability Analyzed (II)," *Zhongguo hangtian,* July 1999, pp. 15-17, translated in FBIS-CHI, 9 October 1999.

[119]Anthony Cave-Brown, *Bodyguard of Lies,* NY: Bantam Books, 1976, pp. 262-267, 636-639.

[120] She Wenbing, "Discussion on Satellite Combat," p. 25.

[121] Ibid.

[122] Shi Shaofan, "Study on High Precision Attitude Control Systems of Foreign Earth-Observation Satellites," *Shanghai hangtian*, No. 6, 2000, p. 49.

American earth-resources satellites with improving U.S. weapons accuracy by up to 10%.[123]

Given these essential space missions, how well can the Chinese space program support them?

REVIEW OF THE CHINESE SPACE PROGRAM

The Chinese space program is an outgrowth of the missile technology development effort, begun in 1956. With the Soviet Union and United States seeking missile and space-launch capabilities, Mao Zedong sought to push the PRC along the same route. In so doing, the Chinese Communist Party (CCP) would facilitate two key goals at once: military modernization and economic development.[31] In May 1958, he made deployment of a Chinese man-made satellite a priority.[125] Towards this end, the Fifth Research Academy of the Ministry of National Defense, was charged with missile development, officially entitled Project 1059. Despite the setback caused by the abrupt withdrawal of Soviet support in the wake of the 1960 Sino-Soviet split, the PRC nonetheless succeeded in launching a Chinese version of the Soviet R-2 missile (itself an improved version of the V-2) in November 1960. This was the progenitor for the subsequent Dongfeng/CSS series of missiles.

Subsequent to the missile program's success, the PRC also began to devote significant resources toward the development of recoverable and artificial earth satellites. Qian Xuesen pushed for resumption of work on a Chinese satellite and promoted research on it within the Fifth Academy. Beginning in 1964, the Commission on Science and Technology for National Defense (COSTND) made satellite development a priority, and engineering development was begun in 1965.[126] This was followed by the creation of the China Academy for Space Technology in 1968, with Qian serving as its first director.

China's first satellite, the Dongfanghong-1 (DFH-1), was lofted on April 24, 1970, making the PRC the fifth country to launch a satellite into orbit. This was both larger and more capable than the first-time satellites of either the United States or the Soviet Union, a point of pride to Chinese scientists. This was followed by several experimental satellites and then the recoverable Fanhui Shi Weixing (FSW) in 1975. The latter was a reconnaissance satellite, making the PRC one of only three space-based reconnaissance powers.

During the Cultural Revolution, the PRC was wracked by internal turmoil verging on civil war. Vice Premier Zhou Enlai, in order to protect higher-level space employees, eventually placed the program under military control, as science came under heavy attack from Mao's Red Guards. It should be noted, however, that while individual scientists and projects were the focus of Red Guard attacks, the space and satellite program, as a concept, actually enjoyed support from all sides, including Lin Biao and the Gang of

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[123] "High-Flying Electronic Ears and Eyes: A Review of Military Satellites," *Zhongguo hangtian,* No. 2, 2001, pp. 27-30.

[124] Anne Gilks, "China's Space Policy: Review and Prospects," *Space Policy,* August 1997.

[125] Li Dayao, "A Survey of the Development of Space Technology in China," *Zhongguo hangtian,* June 1999, pp. 16-19, translated in FBIS-CHI, 21 September 1999.

[126] Ibid.

Four, as well as Zhou. Indeed, the Gang of Four apparently sponsored their own satellite program, the *Ji Shu Shiyan Weixing*, and their own launcher program, the Feng-Bao series. Engineered in Shanghai, the entire family of both launchers and satellites were apparently phased out by the late 1970s, after the fall of the Gang of Four. Indeed, the second launch of the FSW series of rockets in October 1976, was hailed as symbolizing the downfall of the Gang of Four.[127]

While the priority for space under Mao had been national prestige and national security, those goals changed with the accession of Deng Xiaoping to the Chinese premiership. Deng's Four Modernizations program placed highest priority on economic development and scientific developments that would have developmental payoffs. The Chinese space program therefore had to "concentrate on urgently needed and practical applied satellites."[128] While the program sought to reorient itself towards practical applications, it was a relatively low priority for much of the early Deng era, as agricultural reform and industrial reorganization demanded the attention of the leadership.

The creation of Plan 863, however, in March 1986 moved space back into a major position. The brainchild of four senior scientists, Wang Daheng[129], Wang Ganchang, Yang Jiachi[130], and Chen Fangyun[131], Plan 863 was an effort to position the PRC to exploit high technology. Personally endorsed by Deng Xiaoping, the Plan devoted priority to developing high-tech research in seven areas, including aerospace technology, which Deng declared was the "highest priority technology program."[132] This position was supported by both then-General Secretary Zhao Ziyang, as well as Vice Premier Li Peng.

This revived high-level support may have been due, in part, to the contribution of aerospace technology to other national economic development efforts. In the Seventh Five Year Plan, for example, it is reported that some 1,800 aerospace efforts were either converted or otherwise shifted towards commercial production. Indeed, Chinese computer and information technology development, as well as automated control systems and industrial robots, are all at least partially attributed to this shift by the aerospace industry towards civilian use.[133] Subsequently, aerospace projects were highlighted in both the Eighth and Ninth Five Year Plans, including remote sensing and real-time

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[127] Philip S. Clark, "China's Recoverable Satellite Programme," *Jane's Intelligence Review,* November 1993, p. 517.

[128] Li Dayao, "A Survey of the Development of Space Technology in China."

[129] Optics specialist, responsible for rocket and satellite tracking system design, designer of first Chinese ground-imaging cameras.

[130] High-altitude atmospheric physicist, Executive Committee Vice-President of the Chinese Society of Astronautics (1983), responsible for automation in Chinese satellites.

[131] Radio electronics expert, responsible for satellite control systems.

[132] The other areas were biotechnology, information technology, laser technology, automation technology, energy technology, and new materials. *Guojia gao jishu yanjiu fashzan jihua* 863, translated in FBIS-CHI, 21 July 2000.

[133] "China's Aerospace Industry and Civil-Military Industrial Integration," *Zhongguo hangtian,* No. 3, 2001, p. 18.

imaging transmission and processing systems in the Eighth, and modularized imaging systems in the Ninth.[134]

Part of this contribution by the aerospace sector to national economic development is almost certainly derived from the emphasis upon self-reliance. The Chinese space program has generally not utilized foreign technology or designs (the manned program being a major exception, as noted below). By undertaking research, development, testing, and engineering efforts domestically, the PRC has developed its own cadre of engineers, designers, and industries, as well as approaches to problems, that can be utilized to cope with difficulties in other industries. [135] As important, it makes the PRC less vulnerable to foreign pressure and obviates the possibility of "blinding" or silencing the PRC, as occurred in Iraq or Yugoslavia.

Current Chinese Space Capabilities

In order to be a space power, a nation needs to possess three distinct components: launchers, satellites, and a mission support capacity to monitor the satellites and utilize the information. The PRC has succeeded in creating a "full end-to-end research, design, trial-manufacture, production, and testing system" for both satellites and launchers."[136] They also have three separate mission control centers, allowing them significant flexibility in launching satellites. While the PRC's space forces are not yet as sophisticated as those of, for example, the United States, Chinese military and political leaders nonetheless are confident that the PRC can deploy a "space-borne system formed of a space-borne package with multiple (or single) functions that can perform certain military missions [which] is the crux of a space force."[137]

Launchers. The primary Chinese launcher is the Long March (LM) series. The PRC has fielded a range of systems within the LM series that allows them to run the gamut from Low Earth Orbit (LEO), which is generally associated with reconnaissance systems and some communications satellites; geosynchronous, for communications and also missile early warning; and polar-orbiting capabilities, which are primarily associated with meteorological and recon systems. The highlights of the LM family of launchers include:

- The Long March-2 series C and D, which have been primarily used to lift the FSW series of satellites, as well as some of the Iridium communications satellites, into low-earth orbit.

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[134] The Tenth Five Year Plan (2001-2005) includes some 15 billion RMB for Plan 863. This is three times the total of the previous fifteen years. Ibid., and Feng Jing, "863 Program Spurs Science and Technology," *Beijing Review,* Internet Version-WWW, 29 March 2001, translated in FBIS-CHI, 29 March 2001.

[135] "Achievements and Future of China's Satellite Programs," *Zhongguo hangtian,* No. 2, 2001, pp. 11-16.

[136] "Launch of PRC Made Spacecraft Heralded," *Liaowang,* 29 November 1999, translated in FBIS-CHI, 29 November 1999.

[137] Ping Fan and Li Qi, "A Theoretical Discussion of Several Matters Involved in the Development of Military Space Forces," *Zhongguo junshi kexue,* 20 May 1997, pp. 127-131, translated in FBIS-CHI, 20 May 1997.

- The Long March-2E, which can put 9 metric tons into low Earth orbit, from which it is then possible to move the satellite into geostationary or geosynchronous. It is believed that a modified version of this system, the -2F, is the basis of Chinese manned space flights.
- The Long March-3 series gives the PRC the ability to launch objects directly into geosynchronous orbit. The Long March-3B has the greatest thrust of Chinese rockets, and is capable of lofting 4.8 metric tons to geostationary orbit. It is comparable to the Ariane or Delta-type launchers.
- The Long March-4 series has been used primarily to launch polar-orbiting systems, and can launch some 4.2 metric tons to LEO or 2.8 metric tons to polar orbit.[138]

It should be noted that the PRC's launchers are technologically as sophisticated as that of the West. Indeed, the 1984 LM-3 launch demonstrated the ability to place a 1000 kg satellite into geostationary orbit using liquid hydrogen propellants, a capability rivaled, at the time, only by the United States and France. Even now, only five states can presently reach geostationary orbit, the United States, Russia, France, Japan, and China. This is due, in no small part, to the thrust required to launch a satellite to that altitude, but also the technology required to master the apogee kickmotor, which adjusts a satellite from geostationary transfer orbit to circular geostationary, or the perigee kickmotor, a solid rocket booster which moves a satellite from a lower orbit to a higher one.[139] Both of these require a combination of high thrust and precision within a small payload. They also require a fair degree of automation and autonomous computer functioning, since they would often lack a line-of-sight from PRC ground-control.

Launch Sites and Mission Control. To accommodate their various launchers, the PRC has constructed multiple launch sites, again, making them one of the few space powers to have a multiple launch capability. The Jiuquan Satellite Launch Center in the Gobi Desert focuses on low and medium-orbit satellites. The Xichang Space Launch Center, in southwest China, supports all launches for geosynchronous orbit. The Tiayuan Space Launch Center, in northern China, is used for polar orbiting missions.

These are coordinated from the China Satellite Launch and Tracking Control Center (CLTC) in Weinan, near Xi'an in central China. CLTC includes both a Command and Control Center, as well as a Tracking, Telemetry & Control network. CLTC also includes tracking stations in Fujian, Jilin, Guanxi, Nanning and Sichuan provinces.

Supporting these ground-based stations are a series of communications ships, which provide the PRC with overseas tracking abilities. There are three tracking ships (*Yuanwang* 1, 2, and 3) currently in the PRC inventory. More recently, the PRC has begun to forge links with other states in order to establish ground stations. This includes Kiribati in the South Pacific, and a tracking, telemetry, and command station in Namibia. This TT&C station is sited, reportedly, because a Shenzhou reentry vehicle would fly

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[138] Brian Harvey, *China's Space Programme*, London: Wiley-Praxis, 1998.

[139] Meng Zhaoqin and Huang Jianding, *Zhongguo hangtian,* May 1999, translated in FBIS-CHI, 11 July 1999.

over Namibia, as it headed for landing in Inner Mongolia, and was built at the cost of US$1.3 million.[140]

Interestingly, for the PRC's manned space launch program, they constructed, at enormous cost, an additional site, the Beijing Aerospace Directing and Controlling Center (BADCC). The TT&C station, however, reports to Xi'an Satellite Control Center, and not the manned facility at BADCC. In the course of the 1999 Shenzhou test flight, the Chinese deployed the *Yuanwang*-3 tracking ship off the coast of Namibia to track and command retro-fire, for a successful recovery after 14 orbits. This was necessary since the PRC does not, at present, posses the global array of telemetry and downlink stations necessary for round-the-clock monitoring of a spacecraft.

Satellites. Since the (DFH-1) in 1970, the PRC has launched approximately 50 satellites. These have fallen into three primary categories: communications, meteorological, and retrievable remote sensors. Of particular note, almost all have been dual-use in nature, supporting both civil and military efforts. [141]

Communications Satellites: Dongfanghong Series. The PRC has made development of communications systems a priority. Although it had planned on deploying a series of geostationary communications satellites by 1975, the DFH-2, direct successor to the DFH-1, was not launched until nearly a decade later. The DFH-2 series included seven satellites, of which two failed to become operational. This was followed by the DFH-3 series, which was developed in conjunction with Germany's DASA.

The DFH-3 series are relatively capable satellites. They are three-axis stabilized, making them steadier platforms.[142] With 24 C-band transponders, it can transmit six color TV channels, while handling some 8000 phone calls.[143] Of the three DFH-3s launched since 1994, however, only one is believed to still be operational. This is significantly below the projected 8-10 year lifespan.[144] Moreover, Chinese analysts acknowledge that the DFH-3's batteries and power generating capabilities are below international standards.[145]

Communications satellites remain a high priority for the PRC, both due to the continued shortage of phone lines, as well as because some 80% of Chinese communications needs are currently met by transponders on foreign satellites.[146] The Chinese space white paper issued by the State Council noted that a major effort has been underway to distribute Very Small Aperture Terminal (VSAT) communication service. There are now some 70 VSAT systems domestically, with over 15,000 small station users

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[140] Wei Long, "China Gears Up for Shenzhou-3 Launch in Coming Months," www.spacedaily.com, 4 November 2001.

[141] Zhang Guofu and Zheng Shangmin, "Thirty Years of China's Satellite Technology," *Zhongguo hangtian,* September 1996, pp. 20-24, translated in FBIS-CHI, 5 August 1997.

[142] "Achievements and Future of China's Satellite Programs," *Zhongguo hangtian,* No. 2, 2001, pp. 11-16.

[143] Brian Harvey, *China's Space Programme*, London: Wiley-Praxis, 1998, p. 66.

[144] Ibid., p. 69.

[145] "Review and Prospects of China's Communications Satellites," *Zhongguo hangtian,* No. 3, 2001, pp. 9-14.

[146] Ding Henggao, "Speeding Up the Development of Space Industry to Meet the Challenge."

already in place.[147] These are helping to connect the PRC more thoroughly, as well as rapidly bringing phone service where landlines remain uneconomical.

Meteorological Satellites: Fengyun Series. The first Chinese meteorological satellite, *Fengyun*-1 (FY-1) was not launched until 1988. With its launch, the PRC demonstrated an ability to undertake sun-synchronous, polar orbits. This was followed by the *Fengyun*-2, the PRC's first geosynchronous satellite. The FY-1 originally had five channels for visible light and IR measurements, but the third FY-1 had 10 such sensors, increasing its ability to view clouds, land, and sea. The FY-2 is equipped with three channels for visible light, IR, and water vapor.[148] Thus far, the PRC has launched three FY-1 and two FY-2 satellites. Chinese reports indicate that they will seek to have a total of six new FY series satellites by 2008, including several next-generation FY-3 satellites.[149]

The FY series of meteorological satellites provide the PRC with an improved ability to monitor natural disasters and other environmental developments. With its two pass-per-day refresh rate, the FY series of satellites can provide regular updates. The FY-1's Advanced Very High Resolution Radiometer (AVHRR), sensing in the visible, thermal infra-red, and near infra-red bands, can detect forest and grasslands fires. The resulting information has been used to direct firefighting units, including both provincial and local units.[150] Similarly, the PRC has used such information to support flood limitation units, as well as to predict both areas affected by drought and by flood. As important, the PRC has almost certainly developed a cadre of photo- and image-interpreters who are very conversant with the capabilities of their systems.

Retrievable Remote Sensing Satellites: Fanhui Shi Weixing Series. Beginning in 1965[151] the PRC space plan identified reconnaissance as a key area of satellite development, The *Fanhui Shi Weixing* (FSW), first launched in 1975, is probably China's largest series of satellites, with seventeen having been launched, and all but one functioning properly over their life spans. The FSW series made the PRC only the fifth country to be able to retrieve photographs from space. The FSW-0 series was apparently aimed at photoreconnaissance. The follow-on FSW-1 series, however, was apparently dedicated primarily to micro gravity experiments, including animal experiments.

The FSW-2 series, begun in the 1990s, appeared to combine the two, involving both remote sensing and a variety of micro-gravity experiments, including materials processing. The FSW-2 series, however, was both significantly larger than its predecessors, and had better control systems onboard. This included cameras with a reported resolution of 19 meters, making them comparable to U.S. LANDSAT

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[147] PRC State Council, "China's Space Activities," Beijing, PRC: Information Office of the State Council, November 2000, p. 5.

[148] "Achievements and Future of China's Satellite Programs," *Zhongguo hangtian,* No. 2, 2001, pp. 11-16.

[149] Wei Long, "China Plans Six MetSats by 2008," www.spacedaily.com/news/china-01zv.html, 5 September 2001.

[150] Liu Cheng, "The Application of FY-1C Polar Orbiting Meteorological Satellite in Natural Disaster and Environment Monitoring," *Shanghai hangtian,* June 2000, p. 54.

[151] Chou Kuan-wu, "China's Reconnaissance Satellites," *Kuang chiao ching*, 16 March 1998, pp. 36-40, translated in FBIS-CHI, 8 April 1998.

systems.[152] Furthermore, it is described as having limited orbital maneuvering capability.[153] This later series of shots were apparently intended for more explicit commercial use, including land resource management, rail-line surveys, etc.[154]

Table 2.1   FSW Satellites

Name	Weight	Design Lifetime	Launched
FSW-0	1800 kg	3-5 days	1974-1987
FSW-1	2100 kg	8 days	1987-1993
FSW-2	3000 kg	15 days	1992-1996

The payload on all of these systems is a visible-light remote-sensing camera, with a Chinese-designed attitude-control system to point the camera and take photographs on command.[155]

The products from the FSW series have been used for cartographic surveys, as well as provision of basic geographic information. This information, in turn, has been used in planning harbor construction, railway surveys, natural resource surveys, etc.[156] More useful, militarily, Chinese experts from the State Bureau of Surveying and Mapping have used satellite photographs and computer models to create panoramic models.[157]

Other Chinese Satellites. More recently, the Chinese have begun to launch several new series of satellites. These include the *Ziyuan* remote earth-sensing satellites, the *Beidou* navigational satellites, and several micro- and mini-satellites.

The *Ziyuan* series, developed in conjunction with Brazil, marks a major step forward for Chinese remote-sensing capabilities. The *Ziyuan*-1 (ZY-1), launched in October 1999, is a polar-orbiting satellite with a design lifespan of two years, rather than two weeks. More importantly, unlike the FSW series, it does not rely upon dropping film canisters back to earth, but instead, utilizes a set of digital electronic sensors, including a CCD camera, an Infrared Multispectral Scanner (IR-MSS) and a Wide-Field Imager to gather pictures, which it then transmits to a ground station.[158] These systems provide the

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[152] Brian Harvey, "China's Space Programme," p. 89.

[153] Lin Hua-bao, "China's New FSW-2 Retrievable Satellite," *Xiandai bingqi,* December 1998, pp. 6-8.

[154] "Achievements and Future of China's Satellite Programs," *Zhongguo hangtian,* No. 2, 2001, pp. 11-16.

[155] Tang Bochang, "A Review of and Future Prospects for Remote Sensing and Scientific Experiments Using China's Recoverable Satellites," *Zhongguo hangtian,* No. 4, 2001, translated in FBIS-CHI, 14 May 2001.

[156] Ibid.

[157] Ibid.

[158] Chen Yiyuan, "Successful Launch of CBERS-1 Shows China's Space Navigation Technology Has Reached New Heights," *Zhongguo hangtian,* 1 March 2000, pp. 21-28, translated in FBIS-CHI, 14 April 2000.

PRC with a 19.5 meter resolution camera and an infrared multispectral scanner of 78-156 meters resolution.[159]

The ZY-2, launched in September 2000, is believed to be even more capable of fine-resolution observation. With an orbit 40% lower than its predecessor, its cameras are expected to have higher resolution.[160] Two more ZY series satellites are believed to be in development. These will have further improvements in their sensor payloads, including five-meter resolution CCDs.[161]

It should be noted that, again, most of this equipment was developed indigenously in the PRC, though Brazil provided the wide-field imager. The ZY-2, for example, is reported to be entirely of PRC manufacture.[162] This implies that the PRC has successfully coped with one of the more difficult problems, that of attitudinal determination and stabilization. In order to undertake such missions, the attitude control systems need to be extremely precise. Normally, the system should have no more than .1 degree variance in each of its three axes. [163] The level of platform stabilization is a key factor (along with camera capabilities) in improving resolution.

The PRC, in 2000, also launched its first two navigational satellites. The *Beidou* Navigation System (BNS) is comprised of two satellites in geostationary orbit, and is expected to provide full-time, all-weather navigational information.[164] Both satellites were built domestically, at the Space Technology Research Institute, part of the China Aerospace Science and Technology Corporation. The BNS makes the PRC only the third nation to deploy a satellite navigation system, after the United States and the former Soviet Union (although the Russian GLONASS system is believed to have fewer than 11 of its 24 satellites functioning).[165] Chinese officials have noted that it would be used for providing navigational positioning services for ships and railway transport.[166]

In addition, the PRC has also been exploring the possibilities of small satellites, mini-satellites, and microsatellites, all of which are smaller than average, and generally much less expensive. Despite their smaller size, however, they nonetheless can carry significant payloads. In 2000, the PRC launched its first microsatellite. The *Tsinghua*-1 was constructed in conjunction with the University of Surrey in Great Britain, and built in cooperation with Beijing students. The fifty kilogram satellite, equipped with a CCD

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[159] Wu Meirong and Wang Zhimin, *Zhongguo hangtian,* January 2000, pp. 10-14, translated in FBIS-CHI, 25 February 2000.

[160] Orbital altitude and resolution (for a given camera) are inversely related; i.e., the lower the orbit, the better the resolution on the same camera.

[161] Wei Long, "China, Brazil Continue Remote Sensing Cooperation," *Space Daily*, www.spacedaily.com, 28 September 2000.

[162] Xu Fuxiang, "Three Questions Concerning China's Satellites," *Guangming ribao,* 26 February 2001, translated in FBIS-CHI, 2 March 2001.

[163] Shi Shaofan, "Study on High Precision Attitude Control Systems of Foreign Earth-Observation Satellites," *Shanghai hangtian,* No. 6, 2000, p. 49.

[164] Xu Fuxiang, *Zhongguo Hangtian,* No. 2, February 2001, translated in FBIS-CHI, 13 March 2001.

[165] Wei Long, "China Completes First Satellite Navigation System," *Space Daily*, www.spacedaily.com, 8 January 2001.

[166] Xu Fuxiang, "Three Questions Concerning China's Satellites."

camera that can image objects up to 39 meters in three spectral bands, is expected to be the first of several series intended for a Disaster Monitoring and Mitigation network. These are expected to begin daily high-resolution imaging of China and its environs in 2002.[167] At the same time, scientists at the Harbin Institute of Technology in Heilongjiang Province are working on completing the *Tansuo*-1 satellite. Part of the Plan 863 program, the 150-kg TS-1 is expected to carry a linear array of three CCD survey cameras, which can provide image resolution of 10 meters and an image swath-width of 120 km.[168]

Interestingly, there have been a number of Chinese journal articles describing research into satellite formation-keeping, that is, flying a number of satellites in a particular pattern, either on different orbital tracks, or in close formation along a single one. Such a capability would have important military potential. The most obvious is the ability to maneuver a "killer satellite" into an advantageous position.

Relative to small satellites, however, development of precise formation flying could be even more useful. One could trade off the short orbital lifespan of such systems against their virtues of inexpensiveness, often greater reliability, and relative ease of construction.[169] If multiple small satellites are flying along several orbits, or even scattered along a single one, then they would be capable, for example, of more frequent revisits of a given site (in the case of a recon satellites) than a single satellite could achieve. Alternatively, a group of small satellites could be formed into a single orbiting entity; the entire group would act as a single camera or compound lens, for example.[170]

Alternatively, one could launch a number of small-, mini-, or micro-satellites into a single orbit, flying them in formation, and use them in tandem. One example would be to create a single image from several close-flying cameras. Alternatively, one could deploy multiple space-based radars. Coupled with advanced data processing capabilities, space-based radars can differentiate objects that are anywhere from .3-1m in size.[171] Moreover, they can track moving objects, at speeds from 4-100kph.[172] Finally, they can differentiate between objects, i.e., they can discern discrete items as little as one meter apart.[173] Consequently, even a single space-based radar can, in one package, search, discover, differentiate, and then determine the precise location of one or many objects. Linking several of them together would provide a powerful surveillance and reconnaissance tool. Such a "dispersed" system, moreover, would be less vulnerable to countermeasures, since, on the one hand, destruction of a single satellite would be expensive, while at the

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[167] Frank Sietzen, Jr., "Microspace Technology Comes to China," *Space Daily*, www.spacedaily.com, 19 October 2000.

[168] Wei Long, "China to Launch Micro Imaging Birds," *Space Daily*, www.spacedaily.com, 20 November 2000.

[169] Lin Laixing, "Formation Flying of Small Satellites and Its Orbital Configuration," *Chinese Space Science and Technology,* February 2001, p. 23.

[170] Lin Xiqiang and Zhang Yulin, "Optimizing Control of Formation-Keeping of Satellite Constellation Using Aerodynamic Force," *Shanghai hangtian,* June 2000, p. 16.

[171] Wang Jiashou, "Future Sky-Eyes of the Battlefield---Space Radars," *Zhongguo hangtian,* No. 10, 2000, p. 18.

[172] Ibid.

[173] Ibid.

same time it would only marginally affect the overall constellation (which could presumably continue to operate, albeit in a degraded manner).[174]

According to their research papers, the Chinese have examined both aerodynamic/inertial means of allowing satellites to maintain formation, as well as use of GPS. They seem to have concluded that aerodynamic force may be the best means of maintaining position for satellite formations, especially for formation flying by multiple satellites within close proximity to each other.[175] This allows for the most efficient use of available propellant, minimizing the need for repeated burns, which would introduce greater variability into any formation. Such an approach would be applicable to satellites in all orbits, whereas utilizing GPS is possible only in low earth-orbit (LEO), and possibly middle earth-orbit (MEO). For geosynchronous systems, Chinese analysts have determined that GPS is almost certainly infeasible.[176]

Manned Space. Finally, the PRC has also become more engaged in its manned space effort. Putting a Chinese astronaut in orbit was apparently a consideration from the early days of the Chinese space program, specifically with the founding of the Space Flight Medical Research Center, again by Qian Xuesen, in 1968. This was then followed by the first public mention of a manned program in *Navigation Knowledge* in 1978, and Chinese recovery fleet's recovery of a spacecraft in May 1980. This latter incident was not part of the FSW series, the other main recovery-oriented program. Indeed, the FSW-0 and FSW-1 were approximately the size of the American Mercury capsules, and could have (barely) accommodated a human passenger.[177] Other priorities, including economic development and satellite construction, took precedence over such a prestige objective, and the Chinese manned program languished. With the fiftieth anniversary of the founding of the People's Republic, however, the PRC took renewed interest in its manned space program.

The result has been Project 921, embodied in the *Shenzhou* spaceship. The original Project 921 proposal was issued by the Shanghai Astronautics Bureau in October 1993 for inclusion in the Eight and Ninth Five Year Economic Plans. Shanghai proposed the development of six large carrier rockets and eight new spacecraft, including a manned one. Although the extensive launcher program was not approved, construction was started at that time in the north-east suburbs of Beijing on a new flight control center capable of handling manned spacecraft (the BADCC).

Then, in 1994, a cash-strapped Russia indicated its willingness to sell space expertise to China, and when Jiang Zemin visited the Russian Flight Control Centre in Kaliningrad, he noted that there were broad prospects for co-operation between the two countries in space. In March 1995, a deal was signed to transfer manned spacecraft technology to China, including the training of cosmonauts, provision of *Soyuz* spacecraft capsules and life support systems, androgynous docking systems, and space suits. In 1996

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[174] Lin Laixing, "Formation Flying of Small Satellites and Its Orbital Configuration," *Chinese Space Science and Technology,* February 2001, p. 23

[175] Lin and Zhang, "Optimizing Control of Formation-Keeping of Satellite Constellation Using Aerodynamic Force," p. 16.

[176] Yu Jianglin, "Feasibility of Determining the Orbit of Geostationary Satellites Using GPS," *Chinese Space Science and Technology,* No. 4, 2000, pp. 36-41.

[177] Brian Harvey, pp. 145-147.

two Chinese astronauts, Wu Jie and Li Qinglong, began training at the Yuri Gagarin Cosmonaut Training Centre in Russia. After training these men returned to China to in turn train a cadre of Chinese astronauts.

Similar to the Russian *Soyuz* capsule, the *Shenzhou* is actually slightly larger (8.4 tonnes, versus 7.1 and 6.5 tonnes respectively).[178] The vessel also carries two pairs of solar panels (vice one on the *Soyuz*), and is expected to be capable of conducting docking and internal transfers from the outset. Moreover, unlike both the U.S. and Soviet initial manned flights, the Shenzhou is expected to carry a two-man crew on its maiden voyage.[179] The *Shenzhou* has now had two test-launches, and there are indications that a third test may come sometime in 2002, apparently delayed from late 2001.[180]

This program has already incurred enormous costs. The first *Shenzhou* launch, in 1999, involved some 2.5 billion renminbi (RMB, or nearly $700 million), as well as the input of 15 research institutes and 50 military and space enterprises.[181] Including the new Jiuquan launch and rocket assembly facility (in order to accommodate the larger launcher) and the new Beijing mission control center, the cost is apparently several billion dollars.[182]

The tests have also helped Chinese scientists address several key shortcomings. Chinese reports claim that the two *Shenzhou* test-flights have provided opportunities to test and improve "high-precision orbit determination, flight planning automation, reentry and landing control forecasting, and visualization of monitoring displays," as well as to improve the BADCC's ability to handle large quantities of data in real-time.[183] Of particular note is the claim that Chinese engineers have used the manned program's tests to improved their ability to control reentry maneuvers and geometries.

As Chinese commentators have noted, attitude control and determination are key elements in setting the accuracy of satellites, which in turn affects their observational abilities. It is therefore important for them to be able to achieve high levels of stability and precision.[184] This has been a problem for many Chinese satellites, dating back to the first FSW launches.[185] Given the continued Chinese reliance on canister-return (at least on the FSW series of satellites), such improvements have benefits beyond simply the manned space program.

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[178] Philip S. Clark, "China's Space Dream Countdown in Sight," *Jane's Intelligence Review*, 1 September 1999.

[179] Ibid.

[180] Wei Long, "China Gears Up for Shenzhou-3 Launch in Coming Months," www.spacedaily.com, 4 November 2001.

[181] Li Tzu-Ching, "Jiang Uses 'Shenzhou' Spaceship to Sing His Own Praises," *Cheng ming*, 1 December 1999, translated in FBIS-CHI, 1 December 1999.

[182] Wu Ge, "Attention Being Focused on China's Manned Space Program," *Xiandai bingqi,* 2 June 2000, pp. 2-3, translated in FBIS-CHI, 8 August 2000.

[183] Wei Long, "China Gears Up for Shenzhou-3 Launch in Coming Months"

[184] Shi Shaofan, "Study on High Precision Attitude Control Systems of Foreign Earth-Observation Satellites," *Shanghai hangtian,* No. 6, 2000, p. 49.

[185] Philip S. Clark, "China's Recoverable Satellite Programme," p. 517.

Future Chinese Capabilities

Despite this array of capabilities, the PRC's space program still suffers from a number of significant shortcomings. General areas that continue to be problematic include the ability to conduct reconnaissance, monitoring, navigational, weather, survey and mapping, and communications missions.[186] Among these, the top priorities, as noted in the November 2000 Chinese Space White Paper, include PRC development of a long-life satellite ground observation system, a satellite broadcast communications system that does not rely on Western capabilities, and a independent Chinese satellite navigation system.[187] Eventually, the aim would be to orbit multi-function satellites, capable of close coordination with ground-based systems.

At the crucial, if more mundane, level of subsystems development, there are also important deficiencies. In discussing next generation Chinese communications satellites, for example, the Chinese recognize that they require additional research into power systems, including batteries and solar panels, attitude control systems, and onboard computers. While the PRC currently manufactures many, if not all, of these systems, it is acknowledged that the PRC is behind the international standard, much less state of the art.[188]

Any improvement will likely come in a measured pace, rather than as the result of any kind of crash program. The Chinese space program since Deng has been grounded in the philosophy of "not to demand greatness and perfection but rather pursue economy and practicality."[189] The priority under both Deng Xiaoping and Jiang Zemin has been to select limited goals and focus on developing satellites whose capabilities would be most useful for national development.[190] Indeed, the dean of CAST recently noted that China "gave priority to satellites urgently needed by the country. It was decided that a small number of application satellites with direct impact on the national economy and defense buildup would be given priority."[191] Remote sensing, navigation, and communications systems all have national development aspects for the PRC. For a poor nation with relatively limited human and financial capital, such dual-use aspects are essential. The technologies applied against those capabilities, however, must be among the very best that the PRC can provide.

If the overall Chinese space program has had relatively limited goals (focused on developing certain capabilities), and overall satellite program development has focused

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[186] Zhao Dexi, "It is Necessary to Give Serious Attention to Building a Military Aerospace System to Strengthen National Defense," *Zhongguo hangtian*, November 1998, pp. 6-9, translated in FBIS-CHI, 14 January 1999.

[187] "China's Space Activities," p. 6; and Xu Fuxiang, "Three Questions Concerning China's Satellites."

[188] "Review and Prospects of China's Communications Satellites," *Zhongguo hangtian,* No. 3, 2001, p. 13.

[189] Zhao Dexi, "It is Necessary to Give Serious Attention to Building a Military Aerospace System to Strengthen National Defense," pp. 6-9.

[190] Xu Fuxiang, "Three Questions Concerning China's Satellites."

[191] Xu Fuxiang, *Zhongguo hangtian,* February 2001, pp. 11-15, translated in FBIS-CHI, 13 March 2001.

on economic ends, the technological advances that have resulted have generally been in areas that are most likely to have both military **and** economic benefit.

Likely Chinese Space Operations

The PLA, as far as is publicly known, has not promulgated any formal space doctrine. Any predictions of likely Chinese space operations, therefore, are derived from Chinese discussions of space-related operations, coupled with an examination of their current and likely future space capabilities. Based on a survey of Chinese writings, and in light of their capabilities, Chinese space operations in wartime are likely to revolve around efforts at preserving Chinese access to space, while preventing any opponent from fully exploiting it.

PLA Exploitation of Space. For the PLA, a key aspect of Local Wars Under Modern, High-Tech Conditions is the ability to seize information dominance. In this regard, the Chinese have written extensively on the need to wage information warfare (*xinxi zhanzheng*).[192] According to PLA analysts, the necessary C4ISR system is comprised of reconnaissance/surveillance systems ("ears"), data fusion centers and command nodes ("brains"), and C2 structures ("nervous system"). The "ears" gather information, which is analyzed and processed by the "brains," which in turn issue orders via the "nervous system" to component forces and systems to react. The objectives of *xinxi zhanzheng* are, in the course of the campaign, to exploit one's own ears, brain, and nervous system, to seize information dominance, and therefore dominance at the strategic and campaign levels, in order to create the conditions for victory, while denying an enemy such capabilities. Space-based reconnaissance and communications systems are considered essential elements of any such effort.

Towards this end, Chinese forces would seek to utilize their various satellites systems to gather information and coordinate forces in response. Recent exercises suggest that the PLA is already practicing to undertake such operations. During the 2001 Dongshan Island exercises, for example, the PLA "mobilized for the first time a military reconnaissance satellite," which provided the PLA with a 55 nm radius of surveillance.[193] PLA forces apparently sought to coordinate dual-sensor inputs, in order to develop a better picture of the "battlefield." Such an effort requires sensor information management, information synthesis, and sensor implementation coordination, and requires a sophisticated level of information processing.[194] Nonetheless, the PLA recognizes that the ability to combine sensory inputs for a single, integrated image, in particular, the combination of radar and infrared inputs, can provide a significantly better picture of the battlefield.

Similarly, in exercising their "nervous system," the PLA is trying to utilize its communications satellites to provide both point-to-multipoint and multipoint-to-

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[192] *Zhanyixue*, pp. 168-172.

[193] Jin Shaoyang, "Areas Within Circumference of 350 Sea Miles Under Reconnaissance and Control," *Wen wei po*, 12 August 2001, p. A1, translated in FBIS-CHI, 12 August 2001.

[194] *Hangtian kongzhi,* December 1998, translated in FBIS-CHI, 10 March 1999.

multipoint network communications.[195] This would apparently be as a supplement to wire-transmission media like fiber-optics, as well as microwave cellular communications. It has also been reported that the Chinese have been trying to develop data transmission satellites (based on the FSW chassis), in one case experimenting with passing a signal through the FSW-2's transmission and telemetry system.[196]

PLA Denial of Space. Even as the PLA seeks to exploit space for its own purposes, however, its writings suggest that it will seek to prevent its opponents from doing so. Neutralization of enemy C2 systems is a high priority for the PLA. Chinese authors write repeatedly about the essential need to strike and destroy key targets, with C2 systems of particular importance. One article from a leading Chinese military journal notes that key strikes should be aimed against those systems that will affect the entire enemy's military, including recon, C2, and information systems.[197]

Similarly, according to *The Science of Campaigns*, one is expected to attrite the enemy's ability to gather information; to weaken an enemy's ability to control and utilize such information as they do gather; and to influence, weaken, and thoroughly disrupt their ability to observe, to make decisions, and to undertake C2 of their forces. Towards this end, it is explicitly noted that C4ISR systems, especially the opponent's reconnaissance, information transmission, and data fusion centers should be the first target. By disrupting the enemy's "ears, brain, and nervous system," one can achieve significant results for minimal losses, in the least amount of time. This is so important that the authors even discuss the idea of preemption.

> In order to control information power, there must also be preemption. This is a special point of information warfare. For one, information offensives mainly rely on distant battle and stealth in order to be effective, and are best used as a surprise. Secondly, the expenditure of manpower and material in information warfare offensives, as they are not as much compared with traditional offensives, can be sustained; but once the offensive is underway, it can be extended for a prolonged period. Thirdly, information warfare relies on radio and electromagnetic transmissions. Therefore, on the battlefield, any transmission will reveal the location of units. Theoretically, a transmitting information system cannot be completely protected. Moreover, if an information system is destroyed, it will take time to replace and to recover. Therefore, it is clear that whoever strikes first has the advantage. In one blow, they may seize control of the information battlefield.[198]

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[195] Chen Ruming, *China Telecommunications Construction,* No. 8, October 1996, translated in FBIS-CHI, 28 July 1997.

[196] Tang Bochang, "A Review of and Future Prospects for Remote Sensing and Scientific Experiments Using China's Recoverable Satellites," *Zhongguo hangtian,* April, 2001, translated in FBIS-CHI, 14 May 2001.

[197] Xu Jingnian, "Break Through the Knots of Traditional Thinking, Establish Campaign Victory Perspectives," *Junshi xueshu,* March 1999, p. 31.

[198] *Zhanyixue*, p. 177.

A key component of any such preemptive move is the destruction of the enemy's vital points, which in this case, would include reconnaissance and surveillance systems.[199] As one article notes, "the struggle to seize the strategic commanding height in future wars will first be unfolded in the outer space."[200] This is more than just a theoretical observation. In analyses of the Kosovo War, for example, the PLA concluded that it must be capable of disrupting or destroying an opponent's satellites in time of war. In particular, the PLA requires an effective means of "destroying, damaging, and interfering with the enemy's recon/observation and communications satellites. In this manner, we can blind and deafen the enemy, making their command and control retarded."[201]

PLA efforts at defeating enemy space systems would encompass a number of different means, including destruction, as well as avoidance, changing one's owns Standard Operating Procedures (SOP), cheating, and interference with enemy systems.[202] Of these means, destruction has garnered perhaps the most attention in the Western press, with several reports on Chinese interest in developing ASAT systems.[203] Against reconnaissance systems, and also against GPS satellites, the Chinese have mentioned such direct attack means as space mines, lasers, and anti-satellite ("killer") satellites, as well as, in the case of GPS, capturing satellites with manned space-craft. [204]

Denying an opponent effective use of space need not involve such exotic means, however. Chinese writers emphasize that the chances of success are greatest when many different combat methods and combat techniques are utilized. Indeed, it is noted that special operations forces are ideally suited to attack C4ISR targets, since these systems often have weak, soft defenses.[205] Thus, to deprive an opponent of the ability to exploit space, one could attack the relevant ground stations, as well as launch and telemetry centers. [206]

Other, more passive measures, in the meantime, are also emphasized. The Chinese have exhibited significant interest in avoidance, i.e., hiding one's systems from satellite surveillance (e.g., moving them indoors). "Skillful use of technical means to avoid

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[199] Li Shao-peng, "Requirements for Defense When Undertaking Offensive Actions under High-Tech Conditions," *Junshi xueshu,* January 1999, p. 45.

[200] Zhao Shuanlong, "The Initial Battle is the Decisive Battle."

[201] Zhang Shi-ping, "Fighting High-Tech Local Wars Requires New Combat Methods," *Junshi xueshu,* July 1999, p. 16.

[202] She Wen-bing, "Discussion on Satellite Combat," *Zhongguo kongjun,* No. 1, 2001, p. 26.

[203] U.S. Department of Defense, "Future Military Capabilities and Strategy of the People's Republic of China," Washington, DC: Department of Defense, 1998.

[204] Zhu Rin-zhong, "The Theory of GPS and Methods of Countering It," *Junshi xueshu,* May 1999, pp. 58-59.

[205] An Wei-ping, "Difficult Points in the Employment of Special Forces Under Conditions of High Technology," *Junshi xueshu,* September 1999, p. 17.

[206] Ping Fan and Li Qi, "A Theoretical Discussion of Several Matters Involved in the Development of Military Space Forces," *Zhongguo junshi kexue,* 20 May 1997, pp. 127-131, translated in FBIS-CHI, 20 May 1997.

reconnaissance" has been noted and, as important, acted upon.[207] A December 1999 report, for example, indicated that the PLA has actively undertaken anti-reconnaissance training, aimed at avoiding satellite-based detection. The report suggests that a Chengdu MR division became proficient at avoiding detection by satellite means.[208] Other Chinese articles have noted that denial and deception can be an effective counter to enemy efforts at surveillance and tracking.[209]

In addition, one can change one's own systems parameters and or operational patterns, in order to lull an opponent into believing that a particular pattern holds. The Egyptian military, for example, prior to the 1973 war, regularly deployed and operated its forces in such a manner that Israeli analysts no longer accorded it much importance. It is noted that neither Soviet nor American analysts took any greater notice, despite the presence of satellites.

Chinese writings also call for misleading or "cheating" one's opponent, knowing full well that he will see certain things utilizing his satellites. The Yugoslav operation in the Kosovo War is noted as a successful example of "cheating." Through the successful deployment of decoys, and by various operational expediencies, Belgrade was able to prevent NATO from determining the extent to which its aerial bombardment had been successful. Consequently, NATO planners were surprised that so much of the Yugoslav military's equipment had survived the weeks-long aerial bombardment.

The Chinese have also expressed interest in developing electronic-strike capabilities against space-based systems, including both jamming of satellite transmissions and electronic interference with the satellite's actual operation.[210] Indeed, there seems to be a general interest in jammers. Jamming systems, it is suggested, is both technologically straightforward, and relatively inexpensive.[211] The GPS system, in particular, has been the subject of a number of jamming-related articles. These have openly discussed the possibility of orbiting space-based jammers in order to disrupt the GPS signal at its source. [212] Other means include the deployment of UAVs and other automated jammer packages.[213]

Deployment of earth-bound jammers, it is suggested, might even accomplish both exploitation and denial missions. Jamming the signal on earth would not interfere with other states' use of GPS outside the jammer's effective radius. By deploying jammers, it would be possible to degrade the effectiveness of Western weapons that relied on GPS to close on a target, yet leave Chinese PGMs, or other satellite-systems, unscathed. It is

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[207] Wang Baocun, "Information Warfare in the Kosovo Conflict," *Jiefangjun bao,* 25 May 1999, p. 6.

[208] *Sing Tao Jhi Pao* (Internet Version), 6 December 1999, translated in FBIS-CHI, 11 December 1999.

[209] Li Shaopeng, "Requirements for Defense When Undertaking Offensive Actions under High-Tech Conditions," p. 45.

[210] Ping Fan and Li Qi, "A Theoretical Discussion of Several Matters Involved in the Development of Military Space Forces," pp. 127-131.

[211] Ke Weiguo, "Soft Support for Modern High-tech Battlefields: GPS," *Jiefangjun bao,* 18 July 2001.

[212] Zhu Rin-zhong, "The Theory of GPS and Methods of Countering It," pp. 58-59.

[213] Ibid.

noted that there is an enormous additional advantage in relying upon jamming, which are both technologically straightforward and inexpensive. [214]

IMPLICATIONS FOR THE UNITED STATES OF CHINA'S SPACE CAPABILITIES

The PRC's space capabilities makes it a qualitatively different opponent from any other the United States has engaged since the end of the Cold War. Since the advent of the Corona program, no U.S. opponent (e.g., Vietnam, Grenada, Panama, Iraq) has ever had the high-ground advantage over American forces. The ability of the PRC to exploit space directly for its own military ends, with indigenous systems that are not subject to Western "shutter control" or economic blandishment (as in the case of the DoD's purchase of all of Space Imaging's Afghanistan-related imagery) poses a qualitatively different challenge than has occurred previously.

Such capabilities are hardly inconsequential. In the first place, simply by possessing such a robust space capability, the PRC is much less vulnerable to asymmetric operations aimed against it. As noted in one *Junshi Xueshu* article, the United States seeks to undertake asymmetric operations against its opponents through exploitation of technologies and capabilities that its opponents do not possess.[215] This begins at the diplomatic and public opinion level by isolating an opponent, effectively dominating the international debate even before the outbreak of open hostilities. The PRC's space capability, however, leaves it far less vulnerable to such intimidation. With control of its own broadcast and remote sensing satellites, the PRC is less subject to telecommunications isolation, and therefore much less likely to fall to psychological intimidation. The distribution of Very Small Aperture Terminal (VSAT) systems throughout China, for example, means that, short of shooting down Chinese satellites, there will be a satellite telecommunications system in place within the PRC, even if the United States should strike at the ground-based telecommunications infrastructure. Moreover, VSAT systems are mobile, making them extremely difficult to track and destroy. One Chinese author noted that manufacturing capability for VSAT earth stations should be a major priority for Chinese industry.[216]

Similarly, the PRC would not be vulnerable to potential foreign interference in its access to space. During the Gulf War, for example, it was reported that the Western coalition was able to deny Iraq any access to space-based intelligence. In the war against Afghanistan, the U.S. military purchased exclusive rights to commercial satellite imagery of Afghanistan.[217] The PRC, with its own space-based recon assets, would clearly be able to counter any such effort at information denial.

Then there are the more direct military benefits. Chinese authors have, in some cases, explicitly compared their satellite capabilities against military requirements. One

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[214] Ke Weiguo, "Soft Support for Modern High-tech Battlefields: GPS."

[215] Miao Wei-guan, et al., "Slight Analysis of American Asymmetrical Warfare Techniques," *Junshi xueshu,* April 1999, pp. 58-59

[216] Chen Ruming, "China Telecommunications Construction."

[217] John J. Lumpkin, "Military Buys Exclusive Rights to Space Imaging's Pictures of Afghanistan War Zone," www.space.com, 15 October 2001.

article noted that the ZY-1 has a resolution of 19.5 meters, which will allow Beijing to "know the exact location of U.S. aircraft carriers." Such a system, it is noted, "will not have any trouble following the moves of U.S. aircraft carriers which are over 300 meters long…[or] U.S. and Taiwanese destroyers and frigates that are over 100 meters long."[218] Of course, U.S. naval vessels can sail courses that would make them harder to detect, and there are many targets of significant importance that would not be captured by cameras with a resolution of twenty meters. What is apparent, however, is that unless the United States is prepared to destroy or disrupt Chinese satellite systems, American forces will likely have to operate under at least somewhat constrained conditions. This would mark a significant qualitative shift in the nature of any confrontation.

Moreover, the Chinese understanding of the importance of space systems suggests that they may be seeking to effect an even more fundamental shift, this time in the so-called OODA decision-loop. This loop, comprising observation, orientation, decision, and action, posits that every conflict is, in fact, a duel. Each adversary observes (O) his opponent's actions, orients (O) himself to the unfolding situation, decides (D) on the most appropriate response or counter-move, then acts (A). The competitor who moves through this OODA-loop cycle the fastest gains a huge advantage by disrupting his opponent's ability to respond effectively. The faster side effectively gets "inside" the other's decision-making loop. The American conclusion was that it was essential to be faster than the Soviets. The key means of doing so would be to have better means of observation, and better means of disseminating a decision, in order to act. Both of these aspects would be achieved with space-based assets.

It would seem that the PRC, based on recent writings, is moving in the opposite direction. It is not so much seeking to undertake OODA faster than the opponent, but to make the opponent's OODA cycle slow down. Under such circumstances, other factors, including mass, political considerations about casualties and alliance cohesion, etc., will begin to tell. For the PRC, the means of achieving this would also be space, but in this case, the aim would be to deny the U.S. the ability to exploit space freely, rather than necessarily utilizing it themselves. In effect, the PRC appears to be seeking a "space fleet in being."

Given the heavy American dependence on space-based systems for a myriad of missions, degradation of the American space infrastructure, including the ability to achieve space dominance and to exploit space-based sensors and information transmission means freely, would be the equivalent of slowing the American OODA cycle down significantly.

Towards this end, it is not even necessarily a requirement for the PLA to be able to destroy American space-based assets in order to fulfill its goals. A satellite whose transmission are jammed, whose sensors are deceived, whose ground-station is destroyed or whose software shuts down due to viruses is every bit as mission-killed as one which is intercepted by a killer satellite.

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[218] Chou Kuan-wu, "China's Reconnaissance Satellites," *Kuang chiao ching,* 16 March 1998, pp. 36-40, translated in FBIS-CHI, 8 April 1998.

3.   THE REVOLUTION IN RESEARCH AFFAIRS: ONLINE SOURCES
AND THE STUDY OF THE PLA

By Taylor Fravel

INTRODUCTION

This paper argues that online sources will strengthen the study of the PLA through faster, easier and more comprehensive access to information. The ease and facility of access will occur in two different ways. Online sources facilitate access to key research materials that were previously only available in China or at a specialist research library abroad. Hundreds of newspapers, magazines and journals are now only available with a few clicks of the mouse, but most of them can also be swiftly queried through advanced search engines. In addition, online sources also provide access to new outlets of information about the PLA, including government ministries, official information portals, company homepages, news channels, personal web sites, bulletin boards and chat rooms – all accessible with only a PC and a network connection.

Though increased access, online sources are poised to make a significant contribution to study of the PLA.[219] First, the use of online sources will facilitate the establishment of bibliographic control over print material, especially the periodical literature. Through databases of Chinese journals and online library catalogs, the universe of relevant open sources about the PLA can be readily identified and cataloged. While this information will still need to be translated and digested, the field will know what it needs to know despite the proliferation of material that has occurred in the past decade. Because this information is digitized, it can be easily downloaded and cataloged to create customizable databases for different sectors and sub-sectors of the field.

Second, online sources are uniquely exploitable. Before the information age, military related newspapers, magazines and journals were not only difficult to obtain, but searching for information on a particular topic required hours of browsing page by page in a library, hiring a battery of research assistants or hoping that it had been translated by FBIS. Today, many of these sources can be systematically mined through advanced

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[219] For a discussion of the broader impact of online sources on the study of Chinese politics, see M. Taylor Fravel, "Online and on China: Research Sources in the Information Age," *The China Quarterly*, No. 163, September 2000, pp. 821-42. For past bibliographic surveys of material on the PLA, see Robert S. Ross and Paul H. B. Godwin, "New Directions in Chinese Security Studies," in David Shambaugh, ed., *American Studies of Contemporary China*, Armonk, NY: ME Sharpe, 1993; and David Shambaugh, "A Bibliographic Essay on New Sources for the Study of China's Foreign Relations and National Security," in Thomas W. Robinson and David Shambaugh, eds., *Chinese Foreign Policy: Theory and Practice*, New York: Oxford University Press, 1994. For a recent review of the field of PLA studies, see David Shambaugh, "PLA Studies Today: A Maturing Field," in James C. Mulvenon and Andrew N. D. Yang, eds., *The People's Liberation Army in the Information Age*, Santa Monica, CA: RAND, CF-145-CAPP/AF, 1999.

queries of key database and online archives that identify articles not only by author or title, but also by keywords that appear in the main text. Similarly, the military-related Chinese web can be searched with a variety of search tools such as Google and Copernic that can scour the web to identify organizational structures or track important developments.   The ability to search multiple information sources simultaneously and instantaneously constitutes an 'information multiplier' of primary and secondary source material.

Third, with improved bibliographic control and enhanced exploitation, online sources can help fill empirical gaps in knowledge about the PLA and refine existing research. Indeed, when combined with the proliferation of open source materials described in the Medeiros chapter, the field now has the information and the tools to improve the granularity of research on the PLA across a wide range of issues. In the near term, online sources should help refine understanding of PLA organization and reform, the defense industry and aspects of force structure. In the longer term, the impact should be much broader.

These benefits aside, several caveats are necessary. First, while this paper describes online sources for the study of the PLA, analysts should distinguish between military and military-related sources. Military sources refer to information published directly by organizations within the PLA, such as the *Liberation Army Daily* or *Military Economic Research*. Military-related sources refer to information produced by non-military organizations, which contain articles on the PLA, national security strategy or defense technology. Unsurprisingly, military-related sources produce the majority of online information about the PLA and Chinese security.

Second, the availability of electronic sources raises real concerns about the authenticity and credibility of online information. For the online editions of print publications, questions of credibility are not substantially different than before. For unofficial and electronic-only sources, however, concerns of authenticity and credibility are paramount. These sources must not only be used with great care, but also be rigorously cross-referenced. Online sources should be used, but the ease of access should not be confused with a high degree of authenticity.

Third, the fluidity of the Internet complicates the cataloging of online sources, which is like trying to nail jello to a wall. Web addresses change, servers can crash, hosting companies can go bankrupt and sites can be shut down by the authorities. Indeed, when writing this paper, several important sites, especially those linked to military publishing houses, appeared to go off line for a month, while access to periodical databases has been spotty. Cataloging and searching of online sources is an ongoing activity, not a one-time effort.

These caveats notwithstanding, however, I remain an Internet "optimist" in terms the benefits offered for the study of the PLA. A tremendous amount of information is currently available through a number of different open source channels. Electronic archives will only increase, more sources will come online directly or indirectly and the robustness of search engines will all vastly sharpen research on the PLA. Moreover, this electronic information is uniquely exploitable when compared to print material, which can facilitate the creation of customized databases, machine translations and even content

analysis. Thus, the uneven quality of information available today should not bias judgments about what will be available tomorrow.

This paper will proceed as follows. First, I will briefly discuss the technical aspects of surfing the Chinese web, including newly available online machine translation tools. Second, I will review official sources of information, including newspapers, periodicals and defense-related organizations. Third, I will discuss unofficial sources of information, including the military channels of China's leading Internet portals, private military homepages administered by amateur strategists and community bulletin boards. Fourth, I will outline how these sources might impact the field through increased bibliographic control, enhanced exploitation of open source material and improved research on specific aspects of the PLA.

TECHNICAL MATTERS

Viewing Chinese-language web pages involves a one-time configuration of an Internet browser to display Chinese fonts. Searching the web by actively inputting Chinese characters requires software with a special input interface. Most of the common Chinese-language software programs provide both Chinese fonts and input editors. Three of the best-known commercial packages are NJ Star (www.njstar.com), RichWin (richwin.sina.com.cn) and Twin-Bridge (www.twinbridge.com). In addition, Microsoft has now incorporated Chinese language functionality into its software. Versions of Internet Explorer 5.0 and above will automatically detect and view web pages encoded in Chinese, which requires a one-time download of necessary fonts. Microsoft also provides a free character input software that can be used with all of its Office 2000 programs as well as Internet Explorer, though generally speaking the commercial packages are more accurate (www.microsoft.com/windows/ie/features/ime.asp).[220]

One potential obstacle to using online information on the PLA is the dominance of Chinese language web pages. However, advances in computer software have produced a number of useful language aids. First, a number of companies now offer free online machine translation from Chinese to English. In the U.S., two notable services are provided by AltaVista (world.altavisa.com/tr) and WorldLingo (www.worldlingo.com). In China, three sites offer machine translation, which appear to be slightly more accurate – Netat (www.netat.net), WTCyber (www.wtcyber.com), I-Power (www.i-power.com.cn/ipower/trans/index.htm) and 165net (www.165net.com). The translations are often messy, with "美侦察机撞毁我军机事件" translated as "The American reconnaissance plane smashes the incident of my military plan." Nevertheless, these services can help users navigate through a web site, as they not only translate entire pages from Chinese into crude English, but also facilitate surfing around the original site in translation. The Netat translator, for example, splits the browser screen between Chinese and English versions.

Second, a number of real-time dictionaries are available that can be used to query vocabulary words while web surfing on Chinese web pages. These dictionaries operate in tandem with the Internet browser and enable real-time reference functionality. One

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[220] The Windows 2000 operating system includes built-in Chinese language support for all programs.

notable dictionary comes from Kingsoft (ciba.kingsoft.net or www.iciba.net). When the cursor is dragged over a Chinese character or compound, a small pop-up window will appear with several English translations. Use of such a dictionary can greatly expedite assessment of military-related websites, especially those laden with technical terminology. Another useful electronic dictionary comes from Wenlin, a non-profit organization in Berkeley (www.wenlin.com). While it does not permit real-time queries, it can scan downloaded electronic texts and draws upon an electronic version of the venerable John de Francis dictionary.

OFFICIAL SOURCES

Official online information about the PLA comes from three sources – newspapers and online news organizations, magazines and journals, and the web sites of organizations, such as military academies and defense industries.

News Sources

Newspapers serve as the foundation for all facets of Chinese politics, including the PLA. While only a few papers published by the PLA are currently available online, military and defense technology news is available from a wide-range of online newspapers and news sources. Military and military related news sources are listed in Table 3.1 at the end of the chapter.

Military Newspapers. Most importantly, the official "mouth" of China's military, the *Liberation Army Daily*, is available online. The electronic edition can be viewed either by subject heading or by print edition page. The site appears to contain the full-text of the print edition and the archives include articles posted since October 1999. In addition, the site also groups past articles by topic headings, including military technology, political work, logistics, equipment research, military academies, civil defense, army culture, military reference and military medicine.   In addition, the *Liberation Army Daily* site offers a number of other features that are not available in the print edition. One particularly interesting feature is the Military Salon, where the paper invites special guests from different branches of the PLA to discuss a particular topic. In addition, the online edition includes special sections with archived articles as well as custom content. As of this writing, the featured special focused on the "Three Represents Campaign," "PLA Housing Reform" and the "Spy Plane Incident." Other sections include the "Taiwan Problem China's Special Police," "Chinese Navy Demonstration," "Military Uniforms" and "Civil Air Defense Forum" as well as other topics.

The only other military newspaper online is the *China Defense News*. Hosted on the *Liberation Army Daily* site, the *China Defense News* pages include back issues of articles, though the archives begin only in 2001. Queries from the *Liberation Army Daily* search engine will also include articles published in the *China Defense News*. However, what is <u>not</u> online should also be noted. Importantly, none of the military region newspapers have yet to publish online editions, which would of course greatly facilitate online data collection efforts from abroad. If these papers do become available online, the opportunities for online open source exploitation will geometrically increase.

Civilian Newspapers. Online editions of civilian newspapers provide a useful source of news on the PLA. At present, more than 400 newspapers in China publish

online editions. In many cases, online editions not only include all of the material from the print edition, but also additional articles and sections. Moreover, most of these papers both maintain online archives and search engines, which facilitate exploitation of their content. Directories of Chinese newspapers are available from a number of sources, including Sohu (dir.sohu.com/news_media/newspaper/index.html), Sina (search.sina.com.cn/search_dir/nm/pp/) and the Universities Service Center (www.usc.cuhk.edu.hk/link.asp). In particular, three types of papers are especially relevant to the study of the PLA.

National newspapers are published by key party organs in Beijing and the provinces. While all of these papers will cover the PLA, a few devote special sections of their online editions to defense news. For example, the *People's Daily* site maintains a military page that includes articles on the PLA, international military developments, and weapons systems as well as a commentary section that clips articles from other sources. In addition, two online consortiums of print media, the Beijing News Service (BNS)[221] and Eastday,[222] also provide detailed military news channels. BNS provides perhaps one of the best military news channels on the Chinese web. Drawing upon its own reporters as well other official online sources, BNS publishes a significant number of articles each day and groups past articles into eight special sections, including military science, equipment and PLA history.

Specialist newspapers focus on either specific sectors of the economy or functions of the state. With respect to studying the PLA, specialist papers are especially useful for tracking developments in China's defense industries, as each sector and many sub-sectors maintain their own papers. Useful papers online include, the *Science Times*, the *Science & Technology Daily, Space News* and the *China Electronic News* as well as computer industry papers that are almost too numerous to mention. While these papers do not focus explicitly on the military, they often include articles about developments in defense technology and news about key research institutes and personnel.

Local and regional newspapers provide a third useful source of online news. In particular, newspapers from cities with a large military presence or a key military facility might provide an additional source of information that does often not reach the national level. As will be discussed in more detail below, the identification of new MUCDs has resulted from a close reading of the MR papers as well as the local press, including the *Luoyang Daily* (home of 54th Missile Army) and the *Mianyang Daily* (home of the CAEP), both of which are available online.[223] Future efforts to catalog online sources should map local and regional papers to key military base locations and research institutions. While such an effort is currently limited by the uneven diffusion of online

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[221] The Beijing News Service is a consortium of Beijing media properties, including the Beijing Daily (北京日报), Beijing Evening News (北京晚报), Beijing Youth Daily (北京青年报), Beijing Morning News (北京晨报) and Beijing Economic News (北京经济报).

[222] EastDay is a consortium of Shanghai media properties, including the Liberation Daily (解放日报), Wenhui Pao (文汇报), New People Evening News (新民晚报), News Daily (新闻报), Youth Daily (青年报) and Labor Daily (劳动报).

[223] Thanks to Harlan Jencks for identifying the utility of these regional papers.

papers at the local level, it promises to offer an additional and underutilized source of information about the PLA.

Online News Sources. Online news refers to those sources that exist in only electronic form and not in print. Official sources of online news include China's wire services, especially Xinhua and the China News Agency. Xinhua's web site, for example, offers a detailed channel devoted to domestic and international military news. Subheadings include international news, domestic news, equipment news, special topics and military technology. Content comes from Xinhua News reports as well as other Chinese sources, such as the *Liberation Army Daily*. Researchers can search all of Xinhua's online archives since 2000. CDSTIC's CETIN portal also offers an online news service, though this focuses largely on foreign military developments.

Unofficial online news sources include China's Internet portals and other specialized news site. While some of the portals occasionally engage in independent reporting, the majority of news published comes from official online sources, especially the national papers and Xinhua. Nevertheless, the main portals should be consulted, especially Sina and Sohu, as they do not all provide the same stories and tend to cover different aspects of the military.

Military and Military-Related Periodicals

Similar to newspapers, the Internet facilitates access to and exploitation of military and military-related periodicals. Military periodicals refer to those titles published directly by organizations within the PLA, including research institutions. Military-related periodicals refer to those titles whose content often includes articles on the Chinese military, national security strategy or defense technology. Through online editions and specialist databases, researchers can not only remotely tap an ever-growing body of periodical literature, but also use search engines to exploit this source of information systematically.

Perhaps not unsurprisingly, electronic coverage of military and military related periodicals is uneven. Online periodicals represent only a subset of open source titles, which in turn represent only a portion of open and restricted circulation publications. Nevertheless, at least 137 military and military related periodicals are currently available online. Military units publish 37 of these titles, while various defense-related companies, associations and research institutes publish the remainder.[224] These periodicals cover a range of topics, including general military (Table 3.2), aerospace (Table 3.3), aviation (Table 3.4), national security strategy (Table 3.5), ordnance and armament (Table 3.6), shipbuilding and maritime (Table 3.7) and technology and electronics (Table 3.8).

Online military and military related periodicals come from five sources. First, a small number of periodicals are published electronically by the publisher of the title (usually the *zhuguan bumen*). Direct publication is most common on the civilian side of the defense industries, especially aviation and aerospace. Second, a large number of periodicals, especially those relating to ordinance and armament, are available through commercial sources, such as Qikan (www.qikan.com), Wangfang (www.periodicals.com.cn) and I-Power (www.i-power.com.cn). These providers offer

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[224] This list does not include medical-related military publications.

unlimited access to the table of contents for the titles they carry and for-fee access to full text editions. For both direct publication and commercial content providers, online periodical archives are shallow, beginning in either 1999 or 2000.

Third, the majority of online military and military related periodicals publications are available through the China Academic Journals (CAJ) database (www.cnki.net or www.chinajournal.net.cn). The CAJ represents an effort by a Qinghua University subsidiary to create a meta-database of Chinese academic journals from the natural sciences to the humanities and the social sciences.[225] For many titles, the archive starts as early as 1994. Significantly, the database provides a robust search engine that allows researchers to query articles based on title, author, work unit, abstract and subject. The free version of the CAJ database provides access to the table of contents and citation information (www.cnki.net/title/login.asp). The for-fee version, which can be accessed for free from most research libraries in China, allows researchers to search for articles by full-text keywords and to download electronic copies of the articles.[226] Through CAJ, researchers can scan around 55 military and military-related journals through one search. While coverage in terms of the type of journal and depth of archives varies, CAJ represents a powerful tool and is essential for searching a wide range of military and military related publications.

Fourth, a specific database that deserves mention is the Special Topics section of the Academy of Military Science web site. This section, which includes eleven different categories, draws upon a backend database of articles from a variety of open source military periodicals, including *Chinese Military Science* (中国军事科学) and *National Defense* (国防), both which are currently not widely available through the three channels discussed above.[227] Analysts can use this database to identify articles from many military periodicals and down load electronic versions (viewable through MS Word) that include complete citations. Under Information Warfare heading, for example, there are 64 articles drawn from 5 different journals.

Fifth and a most recently, a new source for periodical information has recently become available through the Chongqing Puyin Company. This company produces the Chinese Periodical Database (中文期刊数据库), known as VIP, which collects periodical articles from over 5,000 journals. Moreover, the archives for some titles in CPD extend as far back as 1989, though this does vary by specific periodical. While this database has just been identified, it appears to contain far more military and military-related periodicals than CAJ. In addition, the database appears to contain a limited number of

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[225] To date, CAJ has indexed the full text of articles from more than 3,000 publications and included the table of contents and abstracts for another 3,500 titles.

[226] To view downloaded articles, users need to install special software, which can be downloaded for free from the CAJ website. If access to the full-text version of CAJ is not possible, journals articles can also be acquired through the University of Pittsburgh library. The Gateway Service Center of Chinese Academic Journal Publications works with partner libraries in China, Hong Kong and Taiwan to provide free copies of Chinese language periodical articles (www.library.pitt.edu/gateway/). This Center acquires many of its articles through the CAJ databases.

[227] The main headings include military thought, international security, military strategy, military history, foreign militaries, RMA, war fighting, operations and tactics, military flashpoints, defense construction, army building, and military law.

internally circulated (*neibu*) journals on military and defense technology topics. Similar to CAJ, users can browse through the database either by either journal title or through subject headings. A keyword and full-text search function also appears to be available. For each article, users can download either the citation or full-text.[228] Each citation includes title, author, author work unit, publication, keywords and abstract. Access to this database is usually restricted to a particular research institution, such as the Beida or Qinghua libraries. However, analysts can access the full version from at least two sites (www.istiq.com.cn/vipcgi/login.htm and http://202.101.143.8/), though the search engines do not appear to work from these two sites.

Military and Military Related Organizations

In general terms, few military organizations have established an online presence. Indeed, apart from isolated sideline production factories, the only PLA organizations online are a handful of military academies. Beyond the military, however, a vast number of defense industries have a substantial online presence, which complements the abundance of technical journals discussed above.

Military Academies. The military academies are one of the few military organizations with an official presence on the web. Until it disappeared in 2001, the Academy of Military Science provided the most useful and pertinent site (www.ams.ac.cn). In addition to the article database discussed above, the AMS website includes a link to its open source library as well as the full-text of all seven volumes of *Encyclopedia of Chinese Military Affairs* (中国军事百科全书). In addition, the site has biographies of retired generals, recruitment information for graduate students, links to publications its sponsors and campaign histories. Another important military academy online is the National University of Defense Technology (www.nudt.edu.cn). While not as complete or useful as the AMS one, the NUDT site offers information about curriculum, research projects and related news.

In addition, all of the principal medical academies are online. The First (www.fimmu.edu.cn), Second (www.smmu.edu.cn), Third (www.tmmu.com.cn) and Fourth (www.fmmu.edu.cn) Military Medical Universities are online. While much of the information from these sites focuses squarely on medical topics, they may still provide some small insights into personnel and management issues, as some contain online gazettes about developments in the PLA's institutes and academies. On the Third Military Medical University site, for example, the monthly digest contained a detailed article on how the Shijiazhuang Ground Forces Command Academy was deploying the Internet on campus.

Other military academies have also established online pages, but none are accessible at the moment. These ghost sites include the PAP Academy (武警学院 ,www.wjxy.com), the Chongqing Logistics and Engineering Academy (重庆后勤工程学院

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[228] However, not all titles listed in the database include downloadable files. Also, some titles do not include any entries, but they are presumably being added or updated. To view downloaded articles, users need to install special software, which can be downloaded for free from the company website (www.cqvip.com).

,www.cgleu.edu.cn), the Nanjing Communications and Engineering Academy (南京通信工程学, www.njice.edu.cn), the Academy of Military Economics (军事经济学院, www.whime.edu.cn), PLAAF Telecommunications Engineering Academy (空军电讯工程学院, www.kdy.sxgb.com.cn), the PLA Second Artillery Engineering Academy (解放军第二炮兵工程学院, www.saec.edu.cn) and the PLAAF Missile Academy (空军导弹学院 , http://203.93.40.98/). Either all of their servers are on the same broken backbone network or the sites have been temporarily (or permanently) dismantled.

Finally, a number of the portals and enthusiast sites discussed below have special sections on China's military academies. The Capital Online Military Channel, for example, offers a detailed page on China's military academies (army.263.net/junxiao.htm). In particular, it provides detailed summaries for over 70 different military schools, academies and research institutes. The page on the Second Artillery Command Academy, for example, discusses seven different curriculum majors as well as the general information about its mission and responsibilities (army.263.net/warcollege/jx344.html). Other portals with information about military academies include military channel of the China Youth League and China-School.Net (china.xianhy.com/maindoc/school/junx.htm), which includes detailed descriptions of each school as well as recruitment and curriculum-related information.

Defense Industries. Perhaps as by-product of commercialization and modernization efforts, China's defense industry has embraced the web, creating industry-wide information networks and establishing an online presence for key companies. The General Armament Department's China Defense Science and Technology Information Center (CDSTIC) leads this effort with a meta defense industry portal, the China Engineering and Technology Information Network (CETIN). While the overall purpose of this site is to collect and disseminate information about foreign military technology,[229] it nevertheless includes useful links and information about defense technology in China. The site includes links to document databases, electronic magazines, news summaries as well as research reports and company information. In addition, CETIN sponsors a network of 11 functional and 15 regional online information networks. The functional networks are grouped loosely around different types of technologies, including the CDSTIC site, Nuclear, Aerospace, Aviation, Shipbuilding, Ocean Affairs, North, Electronics, Standardization and Physics. The regional networks typically focus on the industries located in or near the areas.[230] As a result, both the relevant functional and regional CETIN networks should be consulted. These sites, some of which are discussed in detail, provide far more direct information about China's defense industries and technology than the main CETIN site.

When combined with the technical journals, a wealth of information about China's defense industries and R&D exists online. The sites listed in the following tables represent the logical starting points for each defense industrial sector. Further research should systematically map the organizations and publications for each sector, but brevity

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[229] The CETIN site represents just how systematically and thoroughly the Chinese government mines open source material in from the U.S.. The site includes reams of translated DoD documents.

[230] The regional networks include Liaoning, Hebei, Henan, Shanxi, Shaanxi, Shanghai, Jiangsu, Anhui, Jiangxi, Guangdong, Hubei, Hunan, Sichuan, Guizhou and Yunan.

prevents a full discussion here. While the sites listed in Table 3 are not exhaustive, they do include the relevant CETIN functional network as well as homepages for key companies, organizations and research institutes. In particular these sites should be used as gateways or starting points for mapping the online presence of China's defense industries. Sectors covered include general defense industry (Table 3.9), electronics and high technology (Table 3.4), nuclear (Table 3.11), Aerospace (Table 3.12), aviation (Table 3.13), ordnance and armament (Table 3.14) and shipbuilding and maritime (Table 3.15).

Reference Sources

A number of different reference sources and tools are now available online.

Encyclopedias. As mentioned above, the AMS has put its entire encyclopedia online. Users can search by keyword and download the relevant article.

Publishing Houses. The principal military and military related publishers all maintain web pages, which allows analysts to stay abreast of the latest defense related publications. The relevant publishing houses are listed in Table 3.16. These sites usually contain a catalog of all titles currently in print, though they do not usually contain *junnei* or *neibu* titles, which still requires a visit to the publisher to acquire a print copy of the catalog. In addition, the major online bookstores, such as Dang Dang (www.dangdang.com.cn) and Beijing Book City (www.bjbb.com.cn) also allow researchers to search through their collections by publishing house. Finally, China's publishing portal, PeopleSpace, maintains a page devoted to military and military related titles (www.peoplespace.net/chinaBookClass/execute/bookClass.asp?classid=e)

Libraries. All of China's main libraries have excellent web sites, which include access to online catalogs, databases and digital books. Through these sites, analysts can identify relevant open source material just by conducting a simple catalog search. In particular, the Beida (www.lib.pku.edu.cn), Qinghua (www.lib.tsinghua.edu.cn), National Library (www.nlc.gov.cn) and Shanghai (www.libnet.sh.cn) libraries all maintain extensive social science collections with relevant military and military-related titles. In addition, most of these libraries have specialized periodical databases or search engines that can be used to identify particular titles as well as the publisher and circulation classification.

Official Documents. Through the Beijing Document Service, CETIN provides access to a number of military related publications and documents (bds.cetin.net.cn). In addition, through the various subsidiary sites of the CETIN network, a number of document databases are available. The main CETIN database page provides links to 74 databases, though many are technical and others focus on foreign military technologies (210.79.226.16:81/ cetin2/cetin-sjk2.htm). Likewise, the Space China site hosted by CASTC and CAEMC includes a link to a password-protected database (202.96.27.74/reference/). Given the government's apparent passion for putting information online, more databases will surely follow. Researchers should be sure to scan the databases pages of China's key libraries to stay on top of the latest resources.

UNOFFICIAL MILITARY SOURCES

Unofficial Military Websites

Unofficial sites include the military channels of China's main portals (known as "chortals"), individual enthusiast sites and bulletin board services. The chortals' military channels provide convenient and comprehensive coverage of military issues in the PRC, including news as well as analytical commentary, equipment profiles and reference material. While enthusiast sites often cover the same territory (and borrow content from the chortals), they often include a broader range of commentary as well as more detailed information on force structure, order of battle and military life. The content of bulletin boards varies widely and are as subject to emotive vitriol as their counterparts in the U.S. or elsewhere.

All of these unofficial sites must be used with great caution. The primary source of the information published on these sites is often unknown and hence unverifiable. Many of the enthusiast sites in particular are biased by the convictions and the beliefs of their administrators. While many of these sites are run by people who seem to just like military hardware and strategy, others are prone to hyperbole and exaggeration. This is not say that these sites should not be used at all, but that they may be no better than an initial interview with a stranger.

Chortal Military Channels

The military channels or specialist pages of the chortals provide a convenient source of military information. In particular, these channels gather relevant news and information from a wide range of sources on the web. Rather than consult all of these sources independently, analysts can often rely these military channels to stay abreast of the latest open source military news and information.

The military channels of leading portals are summarized in Table 3.17. While each site is different, they all tend to gather the following types of information: military and defense technology news, both domestic and international; armament and equipment information, including technical specifications and photographs; a military digest, including commentary and analytical articles on military developments; historical information, including campaign histories, leadership biographies and organizational histories; reference material, including relevant laws / regulations, uniforms, etc.; and bulletin boards. Most of the portals also include sections devoted to particular topics, especially Taiwan.

Three sites are particularly useful, due in part to the breadth of news that and information that they gather. Indeed, many of the enthusiast sites discussed below, as well as some of the other military channels are take their news and information from these sites. 999 Military Affairs (999 军事) is the military channel of the '39' or '999' portal that is owned by the Sanjiu Enterprise Group, which was part of the GLD. The leading Internet portal Sina.com has teamed up with the publishers of *Naval and Merchant Ships* to produce a joint military channel that draws upon Sina's own reputation for aggressive online reporting. Chinadotcom offers a comprehensive channel that focuses on developments in the PRC. In addition, there is at least one semi-official

portal available, namely the military channel of the China Youth League. While it is not as detailed as those discussed above, it should still be consulted.

Enthusiast Sites

Throughout Chinese society, the Internet now provides a limited platform for personal expression. Amateur strategists and military enthusiasts are no exception and have begun to put their thoughts and ideas online. Concerns about authenticity are paramount. Needless to say, information here must be used with great caution and only after confirmation through other sources. Nevertheless, these sites should be consulted for a number of reasons. First, a number of site administrators appear to be retired soldiers. Second, anecdotal evidence suggests that members of the PLA officer corps also frequent a number of these sites.[231] Third, some of the sites also have useful information that is not available either in print or through other sources on the web. Table 3.18 provides a first attempt to identify and categorize these enthusiast sites. The sites are briefly described and ranked by general usefulness. Most of the sites focus on the four services of the PLA, but a few sites also examine the PAP and veterans issues. Brevity does not permit a detailed and systematic discussion of the information available, but I will review each of the sites by type.

Digest sites include military news and commentary, clippings from other web sites or bulletin boards and electronic books on military topics as well as a bulletin board or chat-room system. These sites can help researchers stay abreast of the latest military writings, though the source of information posted on these sites does vary widely and is often difficult to ascertain. My Memo (我的备忘录) is perhaps the most detailed digest site currently available, with a tremendous amount of commentary on current flashpoint and developments.

Equipment sites gather information on the PLA's arsenal, including numerous photos and technical specifications. Three outstanding equipment sites include China Military Page (中国军事之页), China Weapons Collection (中国武器大全) and Weapons World (兵器世界). All of these sites provide individual pages for each of China's land, sea and air weapons systems. In addition to technical information, these sites provide force structure data as well as limited deployment information, especially for the PLA ground forces and for the PLAN.

Service sites focus on a particular branch of the PLA. Most of the sites in this category focus on either the PLAN or the PLAAF, as the equipment and comprehensive sites routinely cover the PLA ground forces. Chinese Navy Warship Collection (中国海军舰艇大全) is perhaps the best site on the PLAN (though not as comprehensive as the equipment sites discussed above), while Angel Net (天使网) is perhaps the best site on the PLAAF and airpower. In addition, PLAAF Talent Information Net (中国空军人才信息网) provides an interesting perspective on personnel and recruitment issues.

Veterans sites include information on demobilization and employment as well as pertinent news and government regulations. Demobilization (解甲归田) and Old Soldier Net (老兵网) are both interesting places to surf.

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[231] Thanks to Paul Haenle for bringing this to my attention.

Comprehensive sites generally include all of the features of the digest and armament sites and are perhaps the most useful. Ding Sheng's Military Net (鼎盛军事网) is perhaps the most comprehensive military site on the Chinese web, with detailed news, bulletin boards and databases of equipment information. The PLA Page provides a wealth of information about organizational issues concerning the PLA, with separate pages dedicated to PLA equipment, organization and deployment, strategy and tactics, and history. Likewise, Commanding the Three Services (挥师三军) and 21st Century Military Forum (21st 军事论坛) should also be consulted.

Bulletin Boards and Chat Rooms

Chat-rooms and bulletin boards represent a final source of unofficial electronic information about the PLA. Chat-rooms and bulletin boards can be differentiated in terms of the primary hosting organization. As indicated in Table 3.19, three types of bulletin boards exist: those hosted by official organs, those hosted by commercial organizations in China and those hosted overseas. In terms of topics, most BBS focus on general military issues, while a small number focus on the specific services and veterans issues. A number of bulletin boards often carry longer, more discursive articles about developments in the PLA.

While official BBSs are the most likely to be monitored by "big mamas," they should be consulted. For example, the People's Daily Strong Country Forum (强国论坛) has begun to invite researchers and officials special guests to answer questions online. While military officers usually only appear to discuss PLA history, officials and scholars from military-related and national security-related organizations have also appeared. Most recently, Yu Xiaoqiu from CICIR answered questions on the U.S. spy-plane incident. At times, these virtual "interviews" appear to offer more detail than the official MFA sessions and nevertheless make for interesting reading, especially if they can be observed in real-time (as the summaries are often edited).[232]

Within China, unofficial BBS are hosted either by the major portals or commercial hosting companies. Among the portals, Sina, Sohu and NetEase all host BBS devoted to military issues. Sina provide a separate BBS for each branch of the PLA, while Sohu and NetEase offer only general discussion boards. In addition, a number of specialized BBS sites exist and are usually hosted through the enthusiast sites described above, such as Ding Shen's military page. A number of these sites, especially China Soldier (中国土兵网) and Old Squad Leader (老班长) focus on demobilized and retired soldiers and might constitute an interesting source of information personnel and organizational issues.

The bulletin boards hosted outside of China are worth consulting because they lie physically beyond the reach of Beijing's censors and do not face the prospect of being shut down. They are also known as 'safe' forums used by scholars within China to engage in online discussion and debate. The principal overseas bulletin boards are Omnitalk, World Forum and Creaders, all of which have pages devoted to military affairs as well as international relations and Taiwan. On all of these sites, users tend to post essays and articles as well as discussion threads.

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[232] For a complete list of these 'special guests' for 2000 and 2001 go to www.qglt.com/wsrmlt/jbft/home.html.

NET ASSESSMENT

The principal standard of evaluation for research sources is whether they advance the current state of knowledge. Under this criterion, online sources are poised to make a significant and sustained contribution to the field. The ease with which online sources gather information and the availability of crude but still useable machine translation tools suggests that a whole class of sources – newspapers, journals, and magazines – is far more accessible than ever before. Moreover, through a variety of search engines, it also now possible to scan new sources of information about the PLA from the myriad organizational sites, internet portals and personal homepages on the Chinese web. Despite the preliminary attempt to describe the military related sites in this paper, they represent only the tip of the online iceberg. While important sources of information about the PLA will continue to remain in print or only accessible through interviews, the field should nevertheless seize this 'revolution in research affairs' presented by the advent of Internet. In particular, the use of online sources should impact the study of the PLA in three different ways: establishing bibliographic control, facilitating exploitation of open source information and improving the quality of research.

Bibliographic Control

Online sources will help the field to gain bibliographic control over the profusion of new and newly available military source material discussed in the Medeiros chapter. Through remote access to library catalogs, publishing houses and search engines, the outer limits of what 'needs to be known' within the open source literature can be identified. Moreover, with relatively simply queries, this literature can be also cataloged, perhaps through the creation of a stand-alone database in the U.S. for PLA related sources.[233]

While online sources can help to identify key books and monographs, they will be most useful in gaining control over the vast periodical literature that has become available. Through the relaxation of circulation restrictions, an increase in the number of publications on the market and the declining base of material translated by FBIS, the growing periodical literature has become increasingly difficult to control. However, the mating of electronic archives to simple search engines provides a powerful tool for tracking this literature. Analysts can now search for articles from the past 5 to 10 years not only by author, title and journal, but also by abstract, keywords and in many cases full-text.

The use of online sources for bibliographic control will be limited in two ways. First, online sources will not facilitate bibliographic control over *junnei* material. By definition, these sources do not usually appear in any public Chinese library catalog or periodical database. Second, online sources will be of only limited utility in facilitating control over *neibu* material, as many such sources are not yet available online.

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[233] One model for such an endeavor might be the online Bibliography of Asian Studies (www.aasianst.org/bassub.htm) or Lynn White's online bibliography of Chinese politics (www.wws.princeton.edu/~Lwhite/chinabib.pdf).

Enhanced Exploitation

Compared to print materials, online sources are uniquely exploitable. The electronic format facilitates broad, sweeping queries of web pages, online archives and periodical databases that are readily available. Because this information is digitized, it is far easier to download, catalog, translate and disseminate than its print equivalent. Indeed, online sources are perhaps now especially important given the declining base of material that is gathered and translated by FBIS.[234]

Even compared to ten years ago, newspapers, journals and magazines can now be exploited with relative ease through online archives (and CD-ROM products). The power of searching for news and journal articles online cannot be understated, as it represents a major step forward in the study of the PLA as well as Chinese politics more generally. While secrecy and circulation concerns will still limit what is available online in open sources, the advent of these tools represents the normalization of the field as a social science endeavor. In particular, it is now possible to use the news and periodical databases to search for a specific phase, individual or weapons system, thereby rapidly identifying useful documents and greatly increasing the granularity of research. While the online archives are still quite shallow, they will only expand as time progresses.

In addition to the periodical literature, the military-related aspects of the Chinese web – military channels, enthusiast sites, and bulletin boards – can be readily exploited through any search engine. Perhaps the single best way to search the Chinese language web is through Google (www.google.com). Other search engines exist as well, such as Sina, Sohu, and Yeah, but are less thorough and complete than Google. Users can configure Google only to search Chinese language pages (either simplified, traditional or both) or to search in a number of languages. In addition, because Google caches all the pages that it has searched and identified in the past, it is often possible to view a web site that is either inaccessible or out of date. This feature is particularly helpful when searching the Chinese web, where addresses change and servers frequently crash. Google also allows users to search within a particular domain, thereby using Google to search through a particular site or set of sites rather than the entire web.[235]

Going forward, it should be possible to create a simple web-based meta-search engine that would search key Chinese web pages and news sources related to military topics and issues. Such a search engine could be configured to search the archives of multiple news sources simultaneously, as search engines such as Google do not often capture all of these pages. A number of products do this for the web at large, such as Copernic, but a simple meta-search engine for the Chinese military might be a great aid for the field as a whole.

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[234] This does not imply, however, that FBIS is no longer needed. Rather, the implications that it should be easier for FBIS to collect certain types of information online and that because of the declining base, use of online sources will ensure that any open source information is not overlooked.

[235] To do this, add the following syntax to the search field, such as "site:pladaily.com.cn" to search only the Liberation Army Daily site.

Potential Empirical Contributions

While it is perhaps still too early to render a definitive judgment about the empirical impact of online sources, I am personally optimistic about their contribution to the study of the PLA. With increased bibliographic control and enhanced exploitation of open sources, the use of online sources should increase the sharpness and granularity of research on the PLA. While online information in no way negates the use of existing sources, it can perhaps help to fill some of the current gaps in knowledge about the PLA and refine existing research. The discussion of potential empirical contributions that follows below is only suggestive, not exhaustive.

PLA Organization, Management and Personnel. Online sources, especially the *Liberation Army Daily*, allow analysts to stay abreast of key organizational and personnel developments in the PLA. In particular, online sources may contribute to research on military demographics, organizational structure, organizational reform and personnel issues.

To start, online sources should help further the study of military demographics, especially at the elite level. Online newspapers and news sources can be mined to track the activities of the senior staff officers of the PLA. Regional and local papers can be mined to track the activities of MR level commanders and leaders.[236] For example, a generic search for Chi Haotian (迟浩田) returned 12,200 hits in Google and countless articles from *Liberation Army Daily* website (only from 1999 to June 2001), not to mention other online news sources that were not queried. While these figures are more illustrative than substantive, they do clearly indicate the breadth of open source information on the military leadership that is readily accessible.[237] Through similar searches, analysts can begin to build a detailed chronology of the activities of senior military leaders, complementing the organizational information in the Directory of Military Personalities. While not all activities of the military leadership will be mentioned in the public record, this approach would nonetheless identify the gaps that could be filled or inferred from other sources.

Likewise, online sources provide a useful and perhaps efficient tool for organizational mapping, the topic of last year's CAPS-RAND conference.[238] Through generic search engines, analysts can run queries for specific individuals or organizations by name, a process that will not only identify institutional relationships, but also might uncover new sources information. More systematically, the results of such queries will

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[236] For a recent review of changes in the leadership of the PLA, see David Shambaugh, "China's Post-Deng Military Leadership," in James R. Lilley and David Shambaugh, eds., *China's Military Faces the Future*, Armonk, NY: M.E. Sharpe, 1999. For other studies, see James C. Mulvenon, *Professionalization of the Senior Chinese Officer Corps: Trends and Implications,* Santa Monica, CA.: RAND, MR-901-OSD, 1997; and Michael Swaine, *The Military and Political Succession in China: Leadership, Institutions, Beliefs*, Santa Monica, CA: RAND, R-4254-AF, 1992.

[237] On the one hand, these figures certainly over estimate the number of unique web pages containing Chi Haotian, as many sites will carry the same news story. On the other hand, all search engines tend not to update frequently and often miss pages contained in the bowels of any given site, thus understanding the total number of pages available.

[238] James C. Mulvenon and Andrew N.D. Yang, eds., *The People's Liberation Army as Organization*: *Reference Volume v1.0*, Santa Monica, CA: RAND, CF-182-NSRD, 2002.

help to map individuals to key organizations and map organizations to specific research programs and objectives. For example, through the periodical databases and library catalogs, analysts can identify the authors and work units of key articles, which can then be used to infer organizational objectives and specific projects. Through the *Liberation Army Daily* and other online news sources, further links can be established by scouring back issues for discussions and descriptions of different units and institutions. In general, however, such organizational mapping will be probably more successful within China's defense industries, which are more likely to have an online presence and accessible periodicals, than operational warfighting units. The China Shipbuilding Industry Corporation, for example, provides a comprehensive organization chart on its web page, which includes web links (www.csic.com.cn/Csic/cn/compose.asp). Likewise, the Scientific Database (科学数据库) provides a detailed description of research institutes (www.sdb.ac.cn/navigation/).

More broadly, these online sources can be used to better understand the PLA at the mass level or from "the boots up."[239] Many of the information sources cited by Finkelstein, such as PLA-sponsored magazines and provincial newspapers, are readily available online. With respect to professional education and training, China-School.Net provides limited information on the curriculum of the military academies. The *Liberation Army Daily* also includes a special section for discussion of issues concerning military academies and professional education (www.pladaily.com.cn/gb/zgjx/jxxl.html).

With recruiting, for example, the PLA has created a web site that details the exam requirements for technical cadres, which discuss the recruitment and testing regime for foreign language and medical personnel (www.kszx.net.cn/index.asp). Likewise, China-School.Net discusses PLA recruitment policies and procedures for over 70 different academies. PLA technical personnel needs can be identified in part by examining job placement portions of leading technical universities. The Hefei University of Technology, for example, lists openings in the GAD, Second Artillery and Guangdong MR among others (www.hfut.edu.cn/zhidao/xqxx/xqxx.html).

Recruitment and training, however, are only two organizational topics that can be studied through online sources. Many other exist, from internal and logistics to political work and military culture. At the moment, for example, the *Liberation Army Daily* site maintains special sections on the implementation of the 'three represents' campaign, military housing reform and military regulations among others. Tracking of such activities should become even easier as more sources become available electronically, even through enthusiast pages administered by demobilized soldiers.

Defense Industries and Technology. In general terms, online sources offer a treasure trove of information about China's defense industries. As discussed above, information comes from a number of sources, including company sites, research institute homepages and periodical databases. In addition, the advent of online scientific networks and specialist newspapers provide additional sources of useful information,

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[239] For a survey of this research program, see David M. Finkelstein, "Looking for People in the People's Liberation Army: Who Is G. I. Zhou?" (paper presented at the Chinese Military Affairs: A Conference on the State of the Field, National Defense University, 26-27 October 2000).

which will probably only increase with the civilian emphasis on technology-driven modernization and the knowledge economy.

To start, online sources will facilitate tracking the continuous reform and reorganization of China's defense industries.[240] Key companies provide detailed homepages, which are supplemented by online editions of sectoral newspapers, sub-industry information networks and other sites, such as those administered by the Chinese Academy of Sciences. Moreover, analysts can easily tap into the wealth of online information about the reform of state-owned enterprises, such as the homepage of the State Council's Development Research Center (www.drcnet.com.cn) and the *Economic Times* (www.cet.com.cn).

As mentioned above, the proliferation of online sources should facilitate the organizational mapping of China's defense industries. By carefully matching individual researchers to institutions and specific projects, studies of China's defense industries should be able to better understand research projects and priorities as well as R&D processes. In particular, through these mapping techniques, it should be easier to identify the relationship between civilian and military institutes and thus better understand the role that each side plays in the weapons R&D process.

Online sources should also provide important insights into advanced civilian R&D and the prospects for the indigenous development of key weapons systems.[241] A wealth of information now exists in industry publications, company homepages, sectoral information networks and technical journals with which to assess the nuts and bolts of China's technical capacity. While this not a new topic with respect to the study of the PLA, the advent of asymmetrical doctrines, which rely upon high tech platforms, underscore its ongoing importance.[242] Because many of these asymmetrical systems rely upon dual-use technologies that will be developed in the civilian sector, especially for encryption, communications and space-based systems, online open source exploitation ought to bear fruit. In particular, systematic use of these sources, especially the periodical databases, should help separate China's technical ambitions (as reflected by

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[240] For an excellent review of the literature on China's defense industry, see Bates Gill, "Chinese Military-Technical Developments: The Record of Western Assessments," in James C. Mulvenon and Andrew N. D. Yang, eds., *Seeking Truth from Facts: A Retrospective on Chinese Military Studies in the Post-Mao Era*, Santa Monica, CA: RAND, CF-160-CAPP, 2001. For discussion of the recent organizational changes, see John Frankenstein, "China's Defense Industries: A New Course?" in Mulvenon and Yang, eds., *The People's Liberation Army in the Information Age*, Santa Monica: RAND, 1999; Harlan Jencks, "'COSTIND Is Dead, Long Live COSTIND!' Restructuring China's Defense Scientific, Technical and Industrial Sector," in Ibid.; Richard A. Bitzinger, "Going Places or Running in Place? China's Efforts to Leverage Advanced Technologies for Military Use," in Susan M. Puska, ed., *People's Liberation Army After Next*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2000.

[241] For a recent discussion of China's spin-on potential, see Roger Cliff, *The Military Potential of China's Commercial Technology,* Santa Monica, CA: RAND, 2001. Cliff notes the methodological benefit of using these sources. For a discussion of China's technical development, see Bernard D. Cole and Paul H. B. Godwin, "Advanced Military Technology and the PLA: Priorities and Capabilities for the 21st Century," in Larry M. Wortzel, ed., *The Chinese Armed Forces in the 21st Century*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 1999.

[242] Mark Stokes, *China's Strategic Modernization: Implications for the United States*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 1999.

surveys of foreign technologies or 'enthusiastic' reporting of technological breakthroughs) from its technical capabilities (as reflected by relevant research findings and reports), to borrow a well-worn phrase.   To be sure, this is a tall order, as it not only requires advanced Chinese language reading skills, but also sufficient technical knowledge to make the necessary technical judgments. More optimistically, however, it is less and less a problem of access to data, which signifies an important step forward nonetheless.

      Force Structure and Posture. Research on force structure and force posture might also benefit from the use of online sources. In particular, online sources should facilitate research on equipment and platforms, order of battle and deployment, and the prospects for enhanced systems integration.

      Blasko's call for a comprehensive equipment guide is probably already available in discrete pieces online.[243] All of the military channels as well as many of the enthusiast sites contain detailed descriptions of China's military equipment, including technical specifications, numbers in inventory and photographs. For example, a query of the Chinese language web for the J-8 (歼-8) fighter plane returned 21,800 hits in Google. While this information certainly needs to be tested against open source print publications, it appears to offer more detail than what is currently available in English through the *Military Balance*. Equipment for each of the four services is covered, though information on tactical and ballistic missiles is quite thin. Nevertheless, a systematic effort to download all of this information for all platforms, systems and vehicles would probably create such a comprehensive equipment guide. When combined with other sources, it might be possible to begin constructing tables of organization of equipment.

      Online military sources may also help shed light on the deployment and order of battle of the PLA. The recent work by Jencks and Melvin on the changes in the PLA's MUCD system has resulted in part from a thorough mining of online newspapers. A number of enthusiast websites, for example, discuss the MUCD system and provide limited numbers for all of the group armies as well as short discussions of the logic behind the system (www.plapage.com/02/02000917BuduiFanhao.htm). Unfortunately, however, all of these sites have been outdated by the changes that occurred in the fall of 2000, but presumably – hopefully – they will be updated to reflect the new changes

      More generally, the robust enthusiast equipment pages all include limited deployment and order of battle information. Such information is most readily available for the PLA (including components of the group armies) and the PLAN (including the three fleets), but less common for the PAP, the PLAAF and the Second Artillery, where there is almost no information. Some of the tables include unit readiness grades, while others are less detailed. While these are clearly not official sources, they do at least provide a starting point for subsequent discussions and research.

      Online sources may also strengthen understanding of software issues such as systems integration and command and control.[244] The technical aspects of these systems

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[243] Dennis J. Blasko, "PLA Ground Force: Topics for Additional Study," (paper presented at the Chinese Military Affairs: A Conference on the State of the Field, National Defense University, 26-27 October 2000).

[244] See the chapters in Mulvenon and Yang, eds., *The People's Liberation Army in the Information Age.*

and technologies can be examined through the defense industry sites discussed above, as a number of the available journals focus specifically on systems integration, command and control and communications technologies. At the same time, implementation of specific systems and organizational processes can be tracked through online news sources.   While the same technical caveats apply, it should now be easier to distinguish between the theory and reality of marrying known platforms to new software approaches.

Finally, online sources may provide additional insight into organizational changes within the PLA. Through online news sources, especially the *Liberation Army Daily* and the *People's Daily*, it is possible to track announcements in real time. For some reforms, such as logistics, the *LAD* web site actually hosts special collections of relevant news articles, thus simplifying the task of staying abreast of such developments (www.pladaily.com.cn/gb/hqzx/sjlq.html). Through unofficial sources, such as enthusiast pages and bulletin boards, other insights may be gleaned from analytical essays and posted commentary.   The PLA Page, for example, contains a large number of articles on organizational aspects of the PLA (www.plapage.com/02/0200000000Depl.htm).

Strategy and Doctrine. The direct impact of online sources on the study of China's military strategy and doctrine will be limited.[245] Nevertheless, a number of opportunities exist to leverage online sources for the study of operational and tactical doctrine. Through periodical databases, analysts can search beyond the standard journals such as *China Military Science* to identify other authors and articles that address different aspects of the PLA's evolving operational and tactical doctrines. These searches would not only identify potential interviewees, but also facilitate a more detailed mapping of organizations and individuals involved in the formulation of various aspects of the PLA's doctrinal development. Pursuing the digest portions of enthusiast websites and eavesdropping in specific chat-rooms that officials and strategists are known to frequent may also provide additional insights or avenues to explore.

CONCLUSION

In conclusion, two limitations of online sources must be addressed. First, concerns about the authenticity and credibility of online information are paramount. While this concern is less relevant for online sources of print information, it is extremely important

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[245] For recent discussion of China's evolving strategy, see David M. Finkelstein, "China's National Military Strategy," in Ibid.; David Shambaugh, "PLA Strategy & Doctrine: Recommendations for Future Research" (paper presented at the Chinese Military Affairs: A Conference on the State of the Field, National Defense University, 26-27 October 2000); and Paul H. B. Godwin, "Assessing the Evolving Doctrine and Strategy of the Chinese People's Liberation Army: Developing a Framework for Analysis" (paper presented at the Chinese Military Affairs: A Conference on the State of the Field, National Defense University, 26-27 October 2000). On China's evolving doctrine, see Paul H. B. Godwin, "Compensating for Deficiencies: Doctrinal Evolution in the Chinese People's Liberation Army: 1978-1999," in Mulvenon and Yang, eds., *Seeking Truth from Facts*; and Nan Li, "The PLA's Evolving Campaign Doctrine and Strategies," in Mulvenon and Yang, eds., *The People's Liberation Army in the Information Age*.

for unofficial online sources.[246] Personal web pages often exist because the operator has a message to spread.   Nevertheless, concerns about credibility do not mean that information should be ignored. Instead, it might be useful to think about the use of these sources in the same way that interview sources are used – that information must be corroborated from other sources and that credibility can grow or shrink over time. Needless to say, it is probably unwise to ground a major analytical breakthrough only in online information, but it is otherwise sound to follow the digital leads that present themselves.

Second, the impact of online sources on the study of the PLA will be uneven. At the moment, these sources will focus mostly on organizational issues and defense technology. The diffusion of information will change over time, but the immediate impact will be unbalanced. In addition, the level of detail facilitated by online sources may also led analysts to focus on the leaves and branches of the trees rather than the forest itself. While more information is always welcome, perspective will be needed to use and judge this information appropriately.

Nevertheless, through faster, easier and more comprehensive access to information about the PLA, the advent of online sources should make a significant contribution to the field. Indeed, when combined with the profusion of open source material described in the chapter by Medeiros, the field now has the information and tools to improve the resolution and granularity of research across a wide range of issues. While online sources will never replace print and human ones, they should become an essential component of any researchers tool kit.

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[246] Even with official sources, the ease of adding and deleting information online certainly empowers the propaganda apparatus to change its conclusion or verdict on a particular news item after the fact.

Table 3.1   **Military and Civilian News Sources**

Name	Web Address	Archives
MILITARY PAPERS		
Liberation Army Daily (解放军报)	www.pladaily.com.cn	1999
China Defense News (中国国防报)	www.pladaily.com.cn/gb/defence/index.html	1999
CIVILIAN PAPERS		
People's Daily Military News (人日日报军事)	www.people.com.cn/GB/junshi/index.html	1995
China Space News (中国航天报)	www.spacechina.com/news/	1999
China Electronic News (中国电子报)	www.cena.com.cn	2000
China Science Times (科学时报)	www.sciencetimes.com.cn	2000
Science and Technology Daily (科技日报)	www.stdaily.com	1999
Beijing News Service (Military News) (千龙新闻网)	mil.21dnn.com	2000
EastDay (Military News) (东方网)	mil.eastday.cn	2000

Name	Web Address	Archives
Mianyang Daily (绵阳日报)	www.myrbs.com	1999
Luoyang Daily (洛阳日报)	www.lyd.com.cn	One week

ONLINE NEWS

Xinhua Net Military News (新华网军事)	www.xinhuanet.com/mil/index.htm	2000
China News Agency Military Universe (中国新闻网军事天地)	www.chinanews.com.cn/junshi.html	1999
CETIN Daily Defense News (每日防务快讯)	express.cetin.net.cn	1996
Sohu Military News	news.sohu.com/59/89/sohu_subject144148 959.shtml	NA
Sina Military News	dailynews.sina.com.cn/army/index.html	NA

Table 3.2   Military and Military-Related Periodicals (General)

Name	Address	Years	Publisher[†]
China's Air Force (中国空军)	China Periodicals Database	89-00	PLAAF Political Department (空军政治部)
China's PAP21 (中国武警)	China Periodicals Database	99	PAP Political Department (武警部队政治部)
China's Militia (中国民兵)	www.pladaily.com.cn/item/zgmb/	00-01+	GPD PLA Daily Press (解放军总政治部解放军报)
Contemporary Military Affairs (现代军事)	cdstic.cetin.net.cn/xdjs/xdjs.htm (FT) China Periodicals Database	97-01+ 92-00	CDSTIC (中国国防科技信息中心)
Contemporary Navy (当代海军)	China Periodicals Database	99-00	PLAN Political Dept (海军政治部)
Foreign Military Learning (外国军事学术)	www.ams.ac.cn/qikan/xueshu.htm (FT)	99	Academy of Military Science (军事科学院)
Journal of the Army's Party School (兵团党校学报)	www.cnki.net	00-01+	Xinjiang Army Party School (新疆兵团党校)

[†] Unless otherwise indicated, the publisher refers to the zhuguan bumen as listed in the National Library Catalog entry (www.nlc.gov.cn). Moreover, recent organization changes, especially within China's defense industry, are most likely not included.

Name	Address	Years	Publisher†
Journal of the PAP Academy (武警学院学报)	www.cnki.net	99-01+	PAP Academy (武装警察部队学院)
Journal of the PLA Foreign Language Academy (解放军外语学院学报)	www.cnki.net	94-00+	PLA Foreign Language Academy (解放军外语学院)
Military Digest (军事文摘)	jswz.qikan.com (TC/FT)	99-01+	CASC 2nd Academy 208th Institute (中国航天工业总公司 2 院第 208 所)
Military Economic Studies (军事经济研究)	China Periodicals Database	00	Academy of Military Economics (军事经济学院)
Military History Research (军事历史研究)	www.cnki.net	99-00	PLAAF Political Academy (空军政治学院)
Military History (军事历史)	www.ams.ac.cn/qikan/lishi.htm (FT) www.cnki.net	00+ 94-00+	Academy of Military Science (军事科学院)
Military Political Work & Theory Research (军队政工理论研究)	www.cnki.net China Periodicals Database	00+ 00+	Nanjing Political Academy Shanghai Branch (南京政治学院上海分院)
*Military Prospects*** (军事展望)	China Periodicals Database	97-00	China Society for Future Military Studies (中国军事未来研究会)

Name	Address	Years	Publisher[†]
National Defense (国防)	www.ams.ac.cn/qikan/guofang.htm (FT)	97-99	Academy of Military Science (军事科学院)
National Security Bulletin (国家安全通讯)	www.cnki.net	99-00+	Ministry of State Security Political Department (国家安全部政治部)
PLA Pictorial (解放画报)	www.plapic.com.cn (FT)	00-01+	PLA GPD (解放军总政治部)
Political Work Journal (政工学刊)	www.cnki.net	96-00+	PLAN Dalian Warship Academy (海军大连舰艇学院)
World Military Affairs (世界军事)	China Periodicals Database	97-00	ND
Global Military Affairs (环球军事)	www.pladaily.com.cn/item/hqjs/index.htm	01+	GPD PLA Daily Press (解放军总政治部解放军报)

Table 3.3   Military and Military-Related Periodicals (Aerospace)

Name	Address	Years	Publisher[†]
863 Space Technology Bulletin (863 航天技术通讯)	China Periodicals Database	92-99	ND
Aerospace China (中国航天)	aerospacechina.qikan.com (TC/FT) www.space.cetin.net.cn/docs/ht97-b.htm (FT) www.cnki.net	00+ 96-01+ 94-01+	CASTC (中国航天科技集团公司) CAMEC (中国航天机电集团公司)
Aerospace Electronic Warfare (航天电子对抗)	www.cnki.net China Periodicals Database	99-01+ 89-99+	CASC 8511th Institute (航空航天工业部 8511 研究所)
Aerospace Industry Management (航天工业管理)	www.cnki.net	94-01+	CASC (中国航天工业总公司)
Aerospace Shanghai (上海航天)	www.periodicals.com.cn (AB/FT)	00+	Shanghai Academy of Space Technology (上海航天技术研究院)

[†] Unless otherwise indicated, the publisher refers to the *zhuguan bumen* as listed in the National Library Catalog entry (www.nlc.gov.cn). Moreover, recent organization changes, especially within China's defense industry, are most likely not included.

Name	Address	Years	Publisher[†]
Aerospace World (世界航空航天博览)	htbl.qikan.com (FT) www.space.cetin.net.cn/docs/bolan/bl99.htm (TC)	99-01+ 99-01+	CASTC and CAMEC (中国航天科技集团公司,中国航天机电集团公司)
Chinese Space Science & Technology (中国空间科学技术)	www.cast.ac.cn/xxfw/dzqk/zhgkjkxjsh/zhgkjkxjsh.htm www.cnki.net	98-01+ 94-99	CAST (中国空间技术研究院)
Cruise Missiles (飞航导弹)	www.cnki.net China Periodicals Database	94-00+ 89-99+	CASC Third Academy 310th Institute (中国航天工业总公司第 3 研究院 310 所)
Guidance and Detonation** (制导与引信)	www.cnki.net China Periodicals Database	99-01+ 89-00+	CASC Guidance and Detonation Network (航空航天部制导与引信情报网)
International Space (国际太空)	www.cast.ac.cn/xxfw/dzqk/gjtk/gjtk.htm www.cnki.net	98-01+ 95-01+	CAST (中国空间技术研究院)
Journal of Astronautics (宇航学报)	www.cnki.net	94-00+	China Society of Astronautics (中国宇航学会)
Journal of Ballistics (弹道学报)	www.cnki.net	94-99+	Huadong University Ballistics Research Institute (华东工学院弹道研究所)

Name	Address	Years	Publisher†
Journal of Solid Rocket Technology (固体火箭技术)	www.cnki.net China Periodicals Database	95-00+ 90-99+	ND
Missile Testing Technology (导弹试验技术)	China Periodicals Database	89-99	ND
Missiles & Space Vehicles (导弹与航天运载技术)	www.periodicals.com.cn/ (AB/FT) www.i-power.com.cn/ipower/library/ddyhtyzjs/ (FT) 210.72.192.8/magazine/fm.htm (FT) www.cnki.net	99-01+ 99-00+ 99-00+ 94-00+	CALT (中国运载火箭技术研究院)
Satellite Applications (卫星应用)	www.cast.ac.cn/xxfw/dzqk/wxyy/wxyy.htm (A)	98-01+	CAST 5th Academy 512th Institute (中国空间技术研究院 5 院第 512 研究所)
Space Control (航天控制)	www.periodicals.com.cn (AB/FT) www.cnki.net	00+ 94-00+	Beijing Institute of Space Automation and Control (北京航天自动控制研究所)
Space Technology & Civilian Products (航天技术与民品)	www.cnki.net	94-00+	CASC Technology Information Institute (航空航天部航天科技情报研究所)

Name	Address	Years	Publisher†
Tactical Missile Technology (战术导弹技术)	www.cnki.net China Periodicals Database	00+ 89-00+	CASC 3rd Academy (中国航天工业总公司第 3 研究院)

Table 3.4   Military and Military-Related Periodicals (Aviation)

Name	Address	Years	Publisher[†]
Aviation Standardization & Quality (航空标准化与质量)	www.periodicals.com.cn/ (AB/FT) www.cnki.net	98-01+ 94-99+	CSAC 301st Institute (中国航空工业总公司 301 所)
Airborne Weapons (航空兵器)	China Periodicals Database	89-00	CASC Technology Committee 14th Weapons Center (航空工业总公司科技委武器第 014 中心)
Aviation Defense Conversion Technology & Products (航空军转民技术与产品)	www.aeroinfo.com.cn/hkqk.asp China Periodicals Database	93-99+	CASC 628th Institute (中国航空工业总公司第 628 所)
Aviation Knowledge (航空知识)	hkzs.qikan.com (TC/FT)	99-01+	China Society of Aeronautics and Astronautics (中国航空学会)
Chinese Journal of Aeronautics (航空学报)	www.periodicals.com.cn (AB/FT) www.cnki.net	98-01+ 94-01+	China Society of Aeronautics and Astronautics (中国航空学会)

[†] Unless otherwise indicated, the publisher refers to the *zhuguan bumen* as listed in the National Library Catalog entry (www.nlc.gov.cn). Moreover, recent organization changes, especially within China's defense industry, are most likely not included.

Name	Address	Years	Publisher†
Electronic Space Technology** (航空电子技术)	www.cnki.net China Periodicals Database	94-99+ 89-99 +	Published in Shanghai
International Aviation (国际航空)	www.iag.com.cn (FT) www.cnki.net	99-01+ 94-01+	CASC (航空航天工业部)
Journal of the Air Force Engineering University (空军工程大学学报)	www.cnki.net	00-	PLAAF University of Engineering (空军工程大学)
Journal of the Air Force Radar Academy (空军雷达学院学报)	www.cnki.net	99-00+	PLAAF Radar Academy (空军雷达学院)

Table 3.5   Military and Military-Related Periodicals (National Security Strategy)

Name	Address	Years	Publisher†
Contemporary International Relations (现代国际关系)	www.cnki.net	94-01+	CICIR (现代国际关系研究所)
International Studies (国际问题研究)	www.cnki.net	97-01+	MFA Institute of International Studies (国际问题研究所)
Journal of Foreign Affairs College (外交学院学报)	www.cnki.net	94-00+	MFA Foreign Affairs College (外交学院学)
Journal of the Institute of International Relations (国际关系学院学报)	www.cnki.net	94-01+	Institute of International Relations (国际关系学院)
Pacific Journal (太平洋学报)	www.cnki.net	94-01	China Society of the Pacific (中国太平洋学会)
Peace and Development (和平与发展)	www.cnki.net	95-00	Peace and Development Center (平与发展研究中心)
Strategy and Management (战略与管理)	www.cnki.net	94-00+	Society for Strategy and Management (国战略与管理研究会)

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† Unless otherwise indicated, the publisher refers to the *zhuguan bumen* as listed in the National Library Catalog entry (www.nlc.gov.cn). Moreover, recent organization changes, especially within China's defense industry, are most likely not included.

Name	Address	Years	Publisher†
World Politics and Economics (世界经济与政治)	www.cnki.net	95-00+	CASS Institute of World Economics and Politics (中国社会科学院世界经济与政治研究所)

Table 3.6 **Military and Military-Related Periodicals (Ordnance and Armament)**

Name	Address	Years	Publisher†
China's Ordnance Industry (中国兵工)	www.cnki.net	94-99	Ordnance Industry Co (中国兵器工业总公司)
Detonation Intelligence (火工情报)	China Periodicals Database	91-98	ND
Detonation Products (火工品)	www.cnki.net China Periodicals Database	97-99+ 89-99+	MEI 213th Institute (机械电子工业部 213 研究所)
*Foreign Artillery*** (外军炮兵)	China Periodicals Database	89-00	PLA 88200 Unit (中国人民解放军 88200 部队)
*Foreign Military Engineering Equipment & Technology*** (外军工程装备与技术)	China Periodicals Database	89-98	PLA 89001 Unit (中国人民解放军 89001 部队)
Journal of Armored Engineering Institute (装甲兵工程学院学报)	www.periodicals.com.cn www.cnki.net	00+ 00-01+	PLA Institute of Armored Engineering (装甲兵工程学院)
Journal of Artillery Academy (炮兵学院学报)	www.periodicals.com.cn	00+	PLA Artillery Academy (炮兵学院)

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† Unless otherwise indicated, the publisher refers to the *zhuguan bumen* as listed in the National Library Catalog entry (www.nlc.gov.cn). Moreover, recent organization changes, especially within China's defense industry, are most likely not included.

Name	Address	Years	Publisher†
Journal of Explosives & Propellants (火炸药学报)	www.cnki.net China Periodicals Database	94-00+ 94-00+	Ordnance Industry Co 204th Institute (中国兵器工业第 204 研究所)
Journal of Ordnance Engineering Academy (军械工程学院学报)	www.periodicals.com.cn (AB/FT) www.cnki.net	00+ 98-00+	PLA Ordnance Engineering Academy (军械工程学院)
Journal of Rocket & Projectile Guidance (弹箭与制导学报)	www.cnki.net China Periodicals Database	94-00+ 94-00+	China Ordnance Society (中国兵工学会)
Military Engineering Equipment Research ** (工兵装备研究)	China Periodicals Database	89-00	PLA 89001 Unit (中国人民解放军 89001 部队)
Modern Small Arms (现代轻武器)	China Periodicals Database	89-99	GAD Light Weapons Validation Institute (总装备部轻武器论证研究所)
Modern Weaponry (现代兵器)	China Periodicals Database	89-00	Ordnance Industry 210th Institute (兵器工业部 210 所)
Ordnance Industry Journal (兵工学报)	www.cos.org.cn/htmlfile/page0/bgxbtz.htm www.periodicals.com.cn	?? 00-01+	China Ordnance Society (中国兵工学会)

Name	Address	Years	Publisher†
Ordnance Industry Journal (Dynamite and Chemical Engineering) (兵工学报 (火化工分册))	www.cnki.net	94-00+	China Ordnance Society (中国兵工学会)
Ordnance Industry Automation (兵工自动化)	www.cnki.net China Periodicals Database	94-00 89-00	Ordnance Industry Co. 58th Institute (兵器工业第 58 研究所)
Ordnance Journal (Tank and Armored Vehicles) (兵工学报.坦克装甲车与发动机分册)	www.cnki.net	98-00+	China Ordnance Society (中国兵工学会)
Ordnance Knowledge (兵器知识)	www.bqzs.org.cn/main.asp China Periodicals Database	00-01+ 89-00+	China Ordnance Society (中国兵工学会)
*Ordnance Standardization*** (兵工标准化)	China Periodicals Database	90-00	Ordnance Industry Co. Standardization Institute (兵器工业标准化研究所)
Projectile & Rocket Technology (弹箭技术)	www.cnki.net China Periodicals Database	94-98 94-98	Ordnance Industry Co Projectile Information Net (兵器工业弹箭专业情报网)
Sichuan Ordnance Journal (四川兵工学报)	www.periodicals.com.cn China Periodicals Database	00+ 90-99+	Sichuan Ordnance Society (四川省兵工学会)

Name	Address	Years	Publisher[†]
Small Arms (轻兵器)	www.qbq.com.cn, qbq.qikan.com www.periodicals.com.cn China Periodicals Database	00-01+ 98-99 89-00+	Ordnance Industry Co 208th Institute (中国兵器工业第 208 研究所)
Tanks & Armored Vehicles (坦克装甲车辆)	tank.qikan.com China Periodicals Database	00-01+ 89-00+	NORINCO Vehicle Institute (中国北方车辆研究所)
Weapons Materials Science & *Engineering* (兵器材料科学与工程)	www.periodicals.com.cn (AB/FT) www.cnki.net China Periodicals Database	99-01+ 94-00+ 94-00+	China Ordnance Society (Materials Group) (中国兵工学会金属材料学会)
Foreign Artillery Research & *Information*** (外军炮兵研究资料)	China Periodicals Database	92-99	Hefei Artillery Academy 合肥炮兵学院

Table 3.7   Military and Military-Related Periodicals (Shipbuilding and Maritime)

Name	Address	Years	Publisher†
Ship Electronic Engineering (舰船电子工程)	China Periodicals Database	97-99	CSSC Mathematical Engineering Institute (中船总公司武汉数字工程研究所)
*Education, Learning and Research*** 教学与科研(重庆)	China Periodicals Database	89-99	Academy of the PLA Engineering Corp (PLA 工程兵工程学院)
Journal of the Naval Academy of Engineering (海军工程学院学报)	www.periodicals.com.cn (AB/FT) www.cnki.net	00 94-00+	PLAN Academy of Engineering (海军工程学院)
*Marine Optics*** (舰船光学)	China Periodicals Database	89-00	CSSC Huanzhong Photoelectronic Institute (中国船舶工业总公司华中光电技术研究所)
Modern Ships (现代舰船)	210.79.231.2/mseo/ ships.qikan.com China Periodicals Database	00-01+ 00-01+ 89-00	CSIC China Ship Institute Science and Technology Institute (中国舰船研究院科技情报研究所)
*Naval & Merchant Ship Chemical Defense*** (舰船防化)	China Periodicals Database	89-99	Published in Handan, Hebei 邯郸(河北)

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† Unless otherwise indicated, the publisher refers to the *zhuguan bumen* as listed in the National Library Catalog entry (www.nlc.gov.cn). Moreover, recent organization changes, especially within China's defense industry, are most likely not included.

Name	Address	Years	Publisher†
Naval & Merchant Ships (舰船知识)	jczs.sina.com.cn China Periodicals Database	NA 89-00+	Chinese Society of Naval Architects and Marine Engineers (中国造船工程学会)
*Naval Engineering*** (海军工程技术)	China Periodicals Database	89-99	PLAN Dept. of Engineering and Planning (海军工程设计研究局)
*Ship Command & Control System*** (舰船指挥控制系统)	China Periodicals Database	90-97	CSSC Mathematical Engineering Institute (中船总公司武汉数字工程研究所)
*Ship Validation Reference*** (舰船论证参考)	China Periodicals Database	92-99	CSSC Ship Systems Engineering Dept. (船舶系统工程部)
*Ship Engineering Research*** (舰船工程研究)	China Periodicals Database	90-99	CSIC Wuhan Ship Planning Institute (武汉船舶设计研究所)
Ship Science & Technology (舰船科学技术)	www.cnki.net China Periodicals Database	94-01+ 99-00+	CSIC China Naval and Merchant Ship Institute (中国舰船研究院)
Ship Standardization (舰船标准化工程师)	China Periodicals Database	97-99	CSIC China Naval and Merchant Ship Institute 704th Institute (中国舰船研究院 704 研究所)
Ship Standardization & Environmental Condition (舰船标准化与环境条件)	China Periodicals Database	89-99	CSIC 7th Academy Standardization Institute (中国船舶工业总公司第七研究院标准化研究)

Name	Address	Years	Publisher†
Ship Standardization and Quality (船舶标准化与质量)	210.79.232.132/ssq/index.htm (TC)	99-00+?	CSSC Economics and Technology Academy (中国船舶工业总公司综合技术经济研究院)
Ship-based Weapons (舰载武器)	www.cnki.net China Periodicals Database	94-00+ 93-98+	ND
Submarine Academic Research (潜艇学术研究)	China Periodicals Database	90-99	ND
Torpedo & Launching Technology** 鱼雷与发射技术	China Periodicals Database	98-99	CSIC 705th Institute Kunming Branch (中船总第 705 所昆明分部)
*Torpedo Technology*** 鱼雷技术	China Periodicals Database	93-99	CSIC 705th Institute (中国船舶重工集团公司第 705 研究所)

Table 3.8   Military and Military-Related Periodicals (Technology and Electronics)

Name	Address	Years	Publisher†
Aerospace Electronic Countermeasures (航天电子对抗)	www.cnki.net	99-00+	CASC 8511th Institute (航空航天工业部 8511 研究所)
Airborne Radar** (空载雷达)	China Periodicals Database	91-00	CASC 607th Institute (航空航天部 607 所)
C2I Systems and Simulation Technology (情报指挥控制系统与仿真技术)	China Periodicals Database	89-00	CSSC 7th Academy 716th Institute (中国船舶工业总公司 7 研究院 716 研究所)
Chang'an Science & Technology** (长安科技)	China Periodicals Database	89-00	Chang'an Automobile Company (长安汽车有限责任公司技术部)
Communications Countermeasures (通信对抗)	China Periodicals Database	90-00	ND
Communications Today (现代通信)	China Periodicals Database	89-00	China Communications Society (中国通信学会)

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† Unless otherwise indicated, the publisher refers to the *zhuguan bumen* as listed in the National Library Catalog entry (www.nlc.gov.cn). Moreover, recent organization changes, especially within China's defense industry, are most likely not included.

Name	Address	Years	Publisher†
Dual Use Technology and Products (军民两用技术与产品)	www.space.cetin.net.cn/docs/mp97-b.htm www.cnki.net	97-01 00-01+	CASTC (中国航天科技集团公司)
*Electronic Countermeasures*** (电子对抗)	China Periodicals Database	89-00	China Electronics Society (Countermeasures Branch) (中国电子学会电子对抗分会)
Electronic Surveillance Jamming (电子侦察干扰)	China Periodicals Database	89-00	MEI 51st Institute (电子工业部第 51 研究所)
*Electronic Warfare Technology*** (电子对抗技术)	China Periodicals Database	89-00	Machinery and Electronics Industry 29th Institute (机械电子工业部第 29 研究所)
Fire Control Radar Technology (火控雷达技术)	www.cnki.net China Periodicals Database	00+ 89-99	Xi'an Electrical Engineering Institute (西安电子工程研究所)
Firepower and Command & Control (火力与指挥控制)	www.cnki.net	94-00+	Firepower and Command & Control Research Association (火力与指挥控制研究会)
Foreign Military Communications Trends (外军电信动态)	China Periodicals Database	99	ND
Foreign Military Electronic Warfare (外军电子战)	China Periodicals Database	97-00	PLA GSD 54th Institute (总参谋部第 54th 研究所)

Name	Address	Years	Publisher†
*International Electronic Warfare Technology*** (电子战技术文选)	China Periodicals Database	00-90	MEI 219th Institute (电子工业部第 219 研究所)
Journal of Air Force Engineering University (Natural Science) 空军工程大学学报[自然科学版]	www.periodicals.com.cn (AB/FT) www.cnki.net	00-01+ 00	PLAAF Engineering University (空军工程大学)
Journal of Chemical Defense (防化学报)	China Periodicals Database	90-99	PLA Chemical Defense Engineering Institute (防化指挥工程学院)
Journal of Detection & Control (探测与控制学报)	www.cnki.net China Periodicals Database	94-99+ 99+	Xian Machinery Information Institute (西安机电信息研究所)
Journal of Military Communications Technology (军事通信技术)	www.cnki.net China Periodicals Database	99-00+ 90-00+	PLA Communications Engineering Academy (解放军通信工程学院)
*Journal of Modern Military Communications*** (现代军事通信)	China Periodicals Database	95-00	GAD 63rd Institute (总参谋部第六十三研究所)
Journal of Systems Simulation (系统仿真学报)	www.i-power.com.cn/ipower/library/xtfzxb/ www.cnki.net	99-00+ 94-00+	China Society of Systems Simulation (中国系统仿真学会)

Name	Address	Years	Publisher†
Journal of the Institute of Surveying & Mapping (测绘学院学报)	www.periodicals.com.cn (AB/FT) www.cnki.net	00+ 94-00	PLA Information Engineering? University (信息工程大学测绘学报)
Journal of the National University of Defense Technology (国防科技大学学报)	www.cnki.net	94-00+	National University of Defense Technology (国防科技大学)
Journal of the PLA University of Science and Engineering (解放军理工大学学报)	www.periodicals.com.cn (AB/FT) www.cnki.net	00+ 00+	PLA Science and Engineering University (解放军理工大学)
Military Command Automation (军队指挥自动化)	China Periodicals Database	89-99	GSD 61st Institute (总参第 61 研究所)
*Military Standardization*** (军用标准化)	China Periodicals Database	89-00	COSTIND (国防科工委军标出版发行部)
Mine Warfare & Ship Defense (水雷战与舰船防护)	China Periodicals Database	93-99	CSSC 7th Academy 710th Institute (中船总公司 7 院 710 研究所)
Modern Communications Technology (现代通信技术)	China Periodicals Database	91-00	Wuhan
Modern Defense Technology (现代防御技术)	www.cnki.net China Periodicals Database	94-01+ 91-00+	CASC 2nd Planning Dept (航空航天部第二总体设计部)

Name	Address	Years	Publisher†
Modern Radar (现代雷达)	www.i-power.com.cn/ipower/library/xdld/ www.cnki.net China Periodicals Database	99-00+ 94-00+ 89-00+	Published in Nanjing
Ship Electronic Countermeasures (舰船电子对抗)	www.cnki.net China Periodicals Database	99-00+ 99-00+	CSSC Yangzhou 723 Institute (中国船舶工业总公司扬州第 723 研究所)
Radar & Countermeasures (雷达与对抗)	www.cnki.net	94-00+	CSIC Nanjing Ship Radar Institute (南京船舶雷达研究所)
*Radar & Electronic Warfare*** (雷达与电子战)	China Periodicals Database	89-00	PLAAF Second Institute (空军第 2 研究所)
Satellite Surveillance Reference Materials (卫星侦察参考资料)	China Periodicals Database	89-99	ND
Systems Engineering & Electronic Technology (系统工程与电子技术)	www.cnki.net	94-00+	CASC Second Academy (航空航天工业部第二研究院)

Table 3.9   Defense Industries (General)

Name	Address	Summary
China Engineering and Technology Information Net (国工程技术信息网)	www.cetin.net.cn	Meta-portal for China's defense industries. Run by CDSTIC.
COSTIND (国防科工委)	www.costind.gov.cn (E)	Includes comprehensive news channel.
National Science and Technology Library (国家科技图书文献中心)	www.nstl.gov.cn	Includes searchable database.
China Dual-Use High Technology Net (中国军民两用高技术应用网)	www.chinatoptech.com	Website of 航天信息中心 and 航天生产力促进中心. Portal for dual-use technology.
China Defense Science and Technology Information Center (中国国防科技信息中心)	210.79.226.16:81/	Old version of www.cetin.net.cn, ending in 1999 and 2000. Some useful databases.
China Academy of Science (中国科学学院)	www.cas.net.cn	Portal for CAS and its subsidiaries.

Table 3.10   Defense Industries (Electronics And High Technology)

Name	Address	Summary
Ministry of Information Industry (信息产业部)	www.mii.gov.cn	
CETIN Electronics Information Net (中国工程技术电子信息网)	www.electron.cetin.net.cn/	CETIN portal for electronics industry. Administered by MII.
Chinese Institute of Electronics (中国电子学会)	www.cie-china.org	

Table 3.11   Defense Industries (Nuclear)

Name	Address	Summary
CETIN China Physics Net 国工程技术信息网	www.caep.cetin.net.cn	CETIN's portal for physics research
China Atomic Energy Authority 国家原子能机构	www.caea.gov.cn (E)	China's atomic energy regulatory body. Limited info.
China Nuclear Net 国工程技术信核信?息网	www.nuclear.cetin.net.cn	CETIN's portal for the nuclear industry.
China Academy of Engineering Physics 中国工程物理研究院	www.caep.ac.cn	
Institute of High Energy Physics (中国科学院高能物理研究所)	www.ihep.ac.cn	
Institute of Applied Physics and Computational Mathematics (应用物理与计算数学研究所)	www.iapcm.ac.cn	

Table 3.12   Defense Industries (Aerospace)

Name	Address	Summary
China Space Net (中国航天科技信息)	www.space.cetin.net.cn (E)	CETIN's space information net. Site includes space-related news, digests and databases.
China National Space Administration (国家航天局)	www.cnsa.gov.cn (E)	Organization, space news, tech news, space policy, products. Information about various launch missiles
Space China (中国航天网)	www.spacechina.com (E)	Site for China Aerospace Science & Technology Corporation and China Aerospace Machinery & Electronic Corporation.
China Great Wall Industry Co. (中国长城工业总公司)	www.cgwic.com.cn	Detailed information on commercial rockets.
China Space Foundation (中国航天基金会)	www.space.org.cn	
Sino Satellite Communications Co. (鑫诺卫星通信有限公司)	www.sinosatcom.com	
Chinese Academy of Space Technology (中国空间技术研究院)	www.cast.ac.cn	Includes information on China's commercial satellite programs as well as online publications, documents and regulations.

Name	Address	Summary
Chinese Academy of Launch Vehicle Technology (中国运载火箭研究院)	www.calt.com.cn www.calt.ac.cn	
Chinese Society of Aeronautics and Astronautics (中国航空学会)	www.csaa.org.cn	
CSAA Power Association (中国航空学会动力专业分会)	www.csap.org.cn	Includes annual reports and association bulletin.

Table 3.13   Defense Industries (Aviation)

Name	Address	Summary
CETIN Aviation Information (航空信息)	www.aeroinfo.com.cn	CETIN aviation information net. Links to news, databases, online magazines. Section on dual use. Emphasis on foreign developments.
China Aviation Industry Co 1 (中国航空工业第一集团公司)	www.avic1.com.cn	Limited site.
China Aviation Industry Co 2 (中国航空工业第二集团公司)	www.avic2.com	Includes to independent websites for most subsidiaries.
Shenyang Aircraft Corporation 沈阳飞机工业(集团)有限公司	www.sac.com.cn (E)	Includes section on J series of fighter aircraft.
Xian Aircraft Corporation (西安飞机工业(集团)有限责任公司)	www.xac.com.cn (E)	
Chengdu Aircraft Industrial (Group) Company Ltd. 成都飞机工业(集团)有限责任公司	www.cac.com.cn (E)	

Table 3.14   Defense Industries (Ordnance and Armament)

Name	Address	Summary
CETIN Ordnance Information Network	www.north.cetin.net.cn	
China Ordnance Society (中国兵工学会)	www.cos.org.cn	
China North Industries Group (中国兵器工业集团公司)	www.norincogroup.com.cn (E)	Includes detailed list of subsidiaries as well as other info.
China South Industries Group (中国兵器装备集团公司)	www.chinasouth.com.cn (E)	

Table 3.15   Defense Industries (Shipbuilding And Maritime)

Name	Address	Summary
China Ship Net (中国工程技术船舶信息网)	www.ship.cetin.net.cn	CETIN's portal the ship-building industry. Includes information on companies, research, magazines, digests.
Chinese Ocean Affairs (中国海事)	www.csscinfo.com.cn	Website of CSSC. Includes military affairs news section as well as many other channels.
China State Shipbuilding Co. (中国船舶工业集团)	www.cssc.net.cn (E)	Corporate page for CSSC with only limited information. Extensive industry news, but only a few pictures of warships.
China Shipbuilding Net (中国造船)	www.shipbuilding.com.cn (E)	Portal for CSSC subsidiary. Primarily commercial site, with links to shipyards and supply companies, news, products and trading.
China National Shipbuilding Equipment & Materials Co. (中国船舶工业物资总公司)	www.csemc.com/ (E)	
China Ship Trading Network (中国航贸网)	www.snet.com.cn	From the publisher of *Ship Industry Weekly*. Offers news, consulting, companies, IT.
China Shipbuilding Industry Co (中国船舶重工集团)	www.csic.com.cn/Csic/index.asp	Leader info, org structure, survey, shipyards, ship-related, ship repair, marine engineering, marine equipment, and research.

Table 3.16   Defense Related Publishing Houses

Name	Web Address	Supervising Agency[247]
Military Friendship and Literature Press (军事谊文出版社)	80027.peoplespace.net	GSD Political Department Propaganda Office (中国人民解放军总参谋部政治部宣传部)
Beijing Aviation and Aerospace University Press (北京航空航天大学出版社)	81012.peoplespace.net	Beijing Aviation and Aerospace University (北京航空航天大学)
Ordnance Industry Press (兵器工业出版社)	80132.peoplespace.net	China Ordnance Industry Company (中国宾器工业总公司)
National Defense University Press (国防大学出版社)	5626.peoplespace.net	National Defense University (国防大学)
Defense Industry Press (国防工业出版社)	118.peoplespace.net www.ntp.com.cn	GAD (解放军总装备部)
Aviation Industry Press (航空工业出版社)	80134.peoplespace.net	CASC (航空工业总公司)
Great Wall Press (长城出版社)	80017.peoplespace.net	GPD PLA Pictorial Press (解放军总政治部解放军画报社)
PLA Press (解放军出版社)	5065.peoplespace.net	GPD Propaganda Dept (解放军总政治部宣传部)
National University of Defense Technology Press (国防科技大学出版社)	81024.peoplespace.net	National University of Defense Technology (国防科技大学)
Tide Press (海潮出版社)	80151.peoplespace.net	PLAN Headquarters (解放军海军司令部)

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[247] From website or *98 Directory of Chinese Publishers* [98 *Zhongguo chubanzhe minglu*], Beijing: PLA Press, 1998.

Name	Web Address	Supervising Agency[247]
Military Science Press (军事科学出版社)	80021.peoplespace.net	AMS (军事科学学院)
Long March Press (解放军报长征出版社)	www.ams.ac.cn/cbs.htm 80015.peoplespace.net	GPD Liberation Army Daily Press (解放军总政治部解放军报社)
PLA Art and Literature Press (解放军文艺出版社)	5033.peoplespace.net (aka Kunlun Press)	GPD Cultural Dept (解放军总政治部文化部)
Current Affairs Press (时事出版社)	80009.peoplespace.net	CICIR 中国现代国际关系研究所
Blue Sky Press 蓝天出版社	80081.peoplespace.net	PLAAF Political Dept. (空军政治部)

Table 3.17   Internet Portal Military Channels

Name	Rating	Address	Description
999 Military Affairs (999 军事)	军军军	www.999junshi.com (999 portal)	Most sources from other online, esp. AMS. Combination of official media as well as government sources. Commentaries from many sources, including op-eds, *Cankao xiaoxi*, etc. History of each Group Army.
China.com Military Channel (中华网军事频道)	军军军	military.china.com/zh_cn/ (Channel for China.com)	Best for news and commentary / analysis. Useful reference section for Chinese terminology. Good database of pictures and equipment. BBS.
Naval & Merchant Ships / Sina (舰船知识)	军军军	jczs.sina.com.cn (Sina portal)	Excellent source for news, collects from wide range of web sources. Good commentary and reference sections.
Army Landscape Online (军旅风景线)	军军(军)	army.cycnet.com (China Youth League Portal)	Excellent commentary and book reviews. Also includes defense laws and regulations. Good section on military academies and life. Cites *Kongjunbao*
Beijing News Net Military (千龙新闻网)	军军	mil.21dnn.com (Beijing News Service)	Eight military news channels.
CIS Military Channel (中公网军事频道)	军军	junshi.cis.com.cn (CIS portal)	Comprehensive, but news sources not always clear. Commentary and special topics useful. BBS.

Name	Rating	Address	Description
Military Channel (深圳信息港军事频道)	军军	www.21si.net/science/military/index.htm (Shenzhen Information Port portal)	Focus mostly equipment. Good digest section.
World Military Affairs (环球军事)	军军	cn.tom.com/army (TOM.com portal)	Emphasis on global military affairs, but detailed page on China's military. Clips articles from many sources. Good for news about China.
Xinjiang Online (新疆在线)	军军	www.xjonline.com.cn/js/index.asp (Xinjiang Online portal)	Well-referenced clippings for commentary and digest sections.
Capital Online Military Channel (263 军事频道)	军	army.263.net (Capital Online portal)	Not much original content. Detailed descriptions of military academies.
Eastday Military Net (东方军网)	军	mil.eastday.com (Eastday portal)	Good for news. Interesting technology section.
EastNet Military Channel (东方网景军事频道)	军	mil.east.net.cn (Eastnet portal)	Not much original content. Infrequent updates. Interesting commentary section and links to military books.
J&D Online Military Channel (捷德在线军事频道)	军	www.jdnets.com/army/index.asp	No longer updated.
Military Affairs (军事纵横)		www.redarmy.com.cn (NetEase portal)	Mostly news and military equipment. Good order of battle, esp. PLA-N. BBS.

Name	Rating	Address	Description
Suoyou Net Military Affairs (所有网军事)	军	idp.soyou.com/junshi/head	Window on Guangzhou Military World (广州视窗军事世界).
Country within a Country Military Universe (国中国在线之军事天地)	军	www.16167.com/junshi/	
Kingtown Army Base (擎天网军事基地)	军	www.kingtown.net/army/armybase.htm	
Military Golden Net (军事金网)	军	www.swww.com.cn/junshi/ (Sichuan Wide Web portal)	
Heavenly Web Report (天鼎网讯)	(军)	www.top169.net/army/ (Heavenly Web portal)	Searchable database. Under construction.
Eastern Military Net (东方军网)	(军)	www.w555.com/js/ (Eastern Portal)	

Table 3.18   Military Enthusiast Homepages

Name	Rating	Address	Comments
Demobilization (解甲归田)	军军军	wangjinhui.home.chinaren.com (Run by demob. soldier)	Veterans site. Extensive list of regulations and policies. Discussion of demob procedures, employment, etc. BBS.
Angel (天使网)	军军军	www.cnangel.net	PLAAF / airpower site. News and commentary
China's PAP (中国武警)	军军军	go3.163.com/~zhangling0/	PAP site.
Weapons World (兵器世界)	军军军	www.bingqi.net	Equipment site. Good overview of China's force structure. Detailed BBS.
China Military Page (中国军事之页)	军军军	cqch.com.cn/zgjs/ zgjs.yeah.net	Equipment site. Detailed force structure and order of battle for all four services.
China Weapons Collection (中国武器大全)	军军军	coolyi.justhere.net	Equipment site. Detailed force structure and order of battle for all four services.
Military Space (军事空间)	军军军	www.tl.ah163.net/personalhomepage/aaa/aaa/	Comprehensive site. Detailed discussion of each service.
My Memo (我的备忘录)	军军军	memo.363.net	Digest site. Great section of PRC campaign history. Useful section on current conflicts.

Name	Rating	Address	Comments
Military Beacon (军事烽火台)	军军军	www.superarmy.com (registered to individual in Beijing)	Comprehensive site. Useful section on current conflicts. Space weapons section. Extensive picture database.
Commanding the Three Services (挥师三军)	军军军	www.ccjs.net (Luofu forestry centre)	Comprehensive site. Good deal of interesting content, but sources are murky. Section devoted to the carrier. Military digest clips from wide range of sources.
PLA Page (解放军记要)	军军军	www.plapage.com	Comprehensive site. Force structure and order of battle, as well as detailed organizational information.
Ding Shen's Military Net (鼎盛军事网)	军军军	www.star.net.cn	Comprehensive site focusing on commentary and publications. Searchable database. E-magazine. Detailed BBS. Military equipment. Comprehensive digest .
Old Soldier Net (老兵网)	军军(军)	www.laobing.com	Veterans site. Extensive literature section and BBS.
Old Staff Officer (老参谋)	军军(军)	fanfan6.top263.net (Run by retired officer)	Veterans / lifestyle site. Includes original content, esp. on training.
21st Century Military Forum (21st 军事论坛)	军军(军)	21st.onchina.net	Comprehensive site. Includes commentary, news, special topics BBS. Good section on armament as well as force structure and PLA order of battle Will be adding sections on info. war and digital war. Clips from other BBS.

Name	Rating	Address	Comments
Military Alliance (军事同盟)	军军(军)	cokin.myrice.com	Comprehensive site, with focus on armament and equipment. Force structure overview and order of battle.
Old Squad Leader (老班长)	军军	www.laobanzhang.com/	Veterans site. Emphasis on military songs, culture and daily life. BBS.
Army Base (兵站)	军军	www.bingzhan.com (Run by individual in Kunming)	Veterans site. Demobilization information. Registry of retired soldiers .
Chinese Navy Warship Collection (中国海军舰艇大全)	军军	yaomeng.xiloo.com/	PLAN site. Good force structure and deployment.
PLAAF Online	军军	www.geocities.com/pa_rick/ (E)	PLAAF site. Good force structure, some deployment.
PLAAF Talent Information Net (中国空军人才信息网)	军军	www.hy.ccgw.net/rc/	PLAAF site. Focuses on recruitment.
China's PAP (中国武警部队)	军军	wjchina.myrice.com	PAP site.
Weapons Show (兵器图鉴)	军军	weaponshow.myrice.com	Equipment site. No longer updated.
China Military Report (中国军事报道)	军军	www.chinamil.com (Run by individuals in Shenzhen)	Equipment site. Under construction
Equipment Matchups: PRC vs. ROC	军军	www.emeraldesigns.com/matchup/ (E)	Equipment site.

Name	Rating	Address	Comments
World Military Exposition 世界军事博览	军军	go8.163.com/~yzzf/	Equipment site (world). Good coverage of the PLA.
Warmud (军事与泥巴)	军军	www.warmud.com	Digest site. News and commentary. Good clips.
Fierce Tribe?? (猛男部落)	军军	www.ntxjw.com/js/index.htm	Digest site. Interesting section on military thought.
Blue Sea Military Net (观沧海军事网)	军军	www.gchjs.com (Registered to XX in Haikou, Hainan)	Digest site. Equipment and campaign history as well.
Chinese Military Net (华军世界在线)	军军	www.huajun.com (registered to a Beijing company)	Digest site. Good clippings from other sources. Historical focus.
21st Century PLA (廿一世纪解放军)	军军	pla21.xiloo.com/	Digest site.
China Military Digest (中国军事文摘)	军军	http://www.chenghaicity.com/mey/	Digest site.
Long Range Raiders Military Site (奔袭者军事网站)	军军	www.benxizhe.com	Comprehensive site. Interesting section on future warfare.
Shouzifei (???)	军(军)	shouzifei.top263.net/	Education site. Focus on military academies.
Military Reference Materials Page (军事资料站)	军(军)	soldier7451.top263.net/	Digest site

Name	Rating	Address	Comments
Air Killer (???)	军(军)	go4.163.com/airpower/	PLAAF site. Very detailed on equipment.
Comrades in Arms (战友情)	军	zyq.xiloo.com	Veterans site. News and BBS
People's Veteran (人民退伍兵)	军	ypa.home.sohu.com	Veterans site. Includes useful documents essays along with a registry of veterans (with email addresses and ICQ!).
Military Frontline (军事前线)	军	www.crosswinds.net/~militarysite/	Taiwan site.
Chinese Navy and Ocean Territory (中国海军与海洋国土)	军	china-navy.163.net	PLAN site. Good force structure, some deployment. Section on academies and command.
Ocean Net (海网)	军	ohsea.163.net/index.html	PLAN site.
Military Palace (军事龙翔殿)	军	go5.163.com/lbtx/	PLAN site
China Warplane (中国军机)	军	hfxf.top263.net/	PLAAF site. Not updated since 3/01. Some FS
Sukhoi Squadron (苏霍伊之旅)	军	fangyu.xiloo.com/ sukhoi.onchina.net	PLAAF / airpower site. Focus on Su-28. Limited force structure
Navy Base (海军基地)	军	navybase.on.net.cn	Naval site (global). Some PLAN info.

Name	Rating	Address	Comments
Girl Who Wants To Be a Soldier (想当兵的女孩)	军	novemberer.363.net (Run by aspiring female solider)	Lifestyle site. Includes history of female soldiers.
2050 China's Military Development (2050 中国军事展望与假想战争)	军	www.china-avenue.com/nwau/2050/	Future conflict site. Interesting reading. BBS.
Battlefield Commander (战地总指挥)	军	fighter2000_2000.home.chinaren.com/	Equipment site. Focus on foreign military equipment and Taiwan conflict
Military Window (军事之窗)	军	www.win57.com	Equipment site. Focus mostly on foreign equipment.
Chinese Military Equipment Online (中国装备在线)	军	waronline.myetang.com	Equipment site. Under construction.
Military Affairs Photo Box (飘然军事图库)	军	piaoran.6to23.com	Equipment site. Mostly pictures.
Military and Weapon (军事兵器)	军	go3.163.com/~pkz/	Equipment site. Limited deployment.
Weapons Database (武器库)	军	yihot.myetang.com	Equipment site (global). Not much on China.
Online Military Affairs (网络军事纵横)	军	www.bjne.net/mil/	Digest site. Not updated since 2000.

Name	Rating	Address	Comments
China's Battles (中国军战)	军	www.2781cn.com	Digest site. Veterans registry. Limited force structure and deployment.
My Best Life Was in the Military (人生最美是军旅)	军	stpenny.top263.net	Digest site. Section on military life.
Military Affairs 2000 (军事 2000)	军	www.junshi2000.com	Digest site. Not updated since 12/00.
Guangzhou Military Specialist (广州军事家)	军	www.gzjsj.com.cn/	Digest site. Includes e-commerce for military gear.
Chinese Military Affairs (中国军事)	军	chinaha.myrice.com	Digest site. Commentary section useful.
Power China (???)	军	bosszhu.top263.net/	Digest site. Focus on national security strategy.
Yadong Military Net (亚太军事网)	军	www.zhanjiang.gd.cn/home/fyd/	Comprehensive site. Interesting commentary .section. BBS.
World of Iron & Blood (铁血世界)	军	www.txsj.com/home.htm	Comprehensive site. Cool interface, but focus on foreign militaries.
New Dragon Military Affairs (新龙环球军事)	军	www.armystar.com	Comprehensive site.
Armstrong Air force Base (阿姆斯壮空军基地)	军	www.afwing.com	Airpower site (global). Interesting BBS.

Name	Rating	Address	Comments
The Successful Course of Military Affairs (鹏程军事)	军	wpcjs.myrice.com	Digest site.
YPC's Page	军	www.ypc.363.net	Digest site. Interesting section on PLA political work. Site collections dissertations on a wide array of subjects.
Numbers Capital (数码资本)	军	www.163com.net/	Digest site.
Chinese Navy Base (中国海军基地)	(军)	cforce.6to23.com	PLAN site. Under construction
Green Clique (绿色阵营)	(军)	go7.163.com/~huchengshun/	PAP site. No longer updated.
PAP Comrades (武警战友)	(军)	go2.163.com/~zhanyoo/	Focus on martial arts.
Peachboy's Military Net (桃子斋军事天地)	(军)	peachboy.myrice.com (Run by 17 year old from Beijing)	Equipment site. Still under construction.
Chinese Military Affairs (中国军事)	(军)	www.china-contact.com/army/	Equipment site. Photos.
Chinese Military Equipment Garden (中华兵器园)	(军)	njdybz.163.net/	Equipment site.
Hongying's Chinese Military (红鹰-中国军事)	(军)	honying.home.sohu.com/	Equipment site.

Name	Rating	Address	Comments
Battlefield (战地)	(军)	battlefield.myetang.com	Comprehensive site. Interesting pictures of missiles. Not updated since Aug. 2000.
Military Encyclopedia (军事百科)	(军)	www.warlore.com	Comprehensive site. Focus on global military affairs
Great Net (伟网)	(军)	godwar.yeah.net	Under construction.
GR's Military Universe (GR 军事天地)		member.netease.com/~gr/	Comprehensive site. Under-construction, but old site was quite useful.
Red Fort (赤色要塞)		caohanwen.at.china.com	Currently unavailable.
China Ghost Military Net (中华魂军事网)		kobe_xujun.home.chinaren.com/	Currently unavailable.
Military Weaponry (军事武器)		pkz2.myetang.com	Currently unavailable.
China Military Online (中国军政在线)		mymili.at.china.com	Currently unavailable.

Table 3.19   Military Enthusiast Bulletin Boards

Name	Address	Comments
OFFICIAL		
Strong Country Forum (强国论坛)	www.qglt.com (*People's Daily*)	Features online guest speakers from research community
UNOFFICIAL		
Sina 舰船知识	jczs.sina.com.cn/fastbin/list.cgi?_fid=1	Board divided by subject (including the three services, 2nd Artillery, IW)
Sohu	bbs.sohu.com/frame_bbs.php3?bbs_id=9 23	
NetEase	luntan.163.com/subindex.php?dis_id=14	
Xilu	junshi.xilu.com	Detailed BBS from 999Junshi
China Soldier (中国土兵网)	www.chinasoldier.net	BBS-only site, which seems to target demobilized soldiers
Garden of Delight (乐趣园)	www.netsh.com	Host of chat-rooms for enthusiast sites, but not many messages.
Old Squad Leader	www.laobanzhang.com	Veterans BBS site.
Ding Shen's BBS	www.top81.com.cn/bbs/asp/show.asp	Contains eight separate discussion boards.
Excite City	www.excitecity.com/china/chat/military/	
OVERSEAS SITES		
Omnitalk (战争风云)	omniboard.hypermart.net/military/mainpage.pl	Also, see board on Foreign Relations & Strategy and Taiwan

Name	Address	Comments
Huayue 华岳 Military Strategy Forum (军事战略论坛)	huayue.org/HuaShan/BBS/junshi/gbcurrent.html	Frequent postings of longer articles on national security strategy
Creaders Military Universe (万维军事天地)	www.cmilitary.com/cgi-bin/mainpage.cgi	
World Military Forum (世界军事论坛)	www.wforum.com/wmf/	Sites also include security strategy board.
Commentary (论点)	www.lundian.com/forum/normal/chinese/10800.html	
Century China	centurychina.com/plaboard/forum.shtml (E)	
China Defense	anyboard.net/gov/mil/anyboard/index.html (E)	

4.   UNDRESSING THE DRAGON: RESEARCHING THE PLA THROUGH OPEN SOURCE EXPLOITATION[248]

By Evan S. Medeiros

INTRODUCTION

China's rise as a regional and global power has prompted a growing interest in the capabilities and intentions of the Chinese People's Liberation Army (PLA). The international community of PLA watchers now has the chance to develop a more accurate understanding of these critical issues by systematically exploiting open source materials which have mushroomed in recent years.[249] Scholars and researchers throughout the world now have access to a plethora of Chinese-language materials on the PLA.[250] The growth of information about the Chinese military stands in stark contrast to the research difficulties stemming from a paucity of usable information over a decade ago.

The field of PLA studies stands at a critical juncture. It now has access to the types of data needed to conduct analysis on all aspects of the PLA. Yet, the massive proliferation of open source information on the PLA presents new and more complicated challenges to scholars and analysts of the Chinese military. Gaining access to material on military issues is no longer the central research barrier. Many publications can be found in libraries throughout China, purchased in bookstores, or viewed on the internet. Rather, establishing bibliographic control over this information and properly exploiting it

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[248] This paper benefited from the insights and experience of several people. The author would like to thank Ken Allen, Monte Bullard, Tom Christianson, David Finkelstein, M.Taylor Fravel, Paul Haenle, Eric Heginbotham, Harlan Jencks, Iain Johnston, Roy Kamphausen, Susan Lawrence, James Mulvenon, Remo Payson, Phillip Saunders, David Shambaugh, Ann Stevenson Yang, and Jing-dong Yuan. Stephanie Lieggi, a Monterey Institute graduate research assistance, deserves special thanks for her assistance in producing Appendix I. All mistakes are my own.

[249] This paper broadly defines "open source" research materials as ones which are publicly available in Chinese bookstores, libraries, postal kiosks (*shubao*书报), and other publishing outlets. This paper also discusses "internal circulation" (*neibu faxing* 内部发行) and "internal military circulation" (*junnei faxing* 军内发行) publications which are occasionally accessible. This paper does not discuss the use of interviews of Chinese military experts. To be sure, this is a critical aspect of researching the PLA and has many synergies with open-source research. For the sake of brevity, it was not addressed.

[250] Very few articles have addressed these trends. See David Shambaugh, "PLA Studies: A Maturing Field," in James C. Mulvenon and Richard Yang , eds., *The People's Liberation Army and the Information Age*, Santa Monica, CA: RAND , CF-145-CAPP/AF, 2000; David Shambaugh, "A Bibliographical Essay on New Sources for the Study of China's Foreign Relations and National Security," in Thomas W. Robinson and David Shambaugh, eds., *Chinese Foreign Policy: Theory and Practice*, Oxford, UK: Clarendon Press, 1994; Robert S. Ross and Paul H.B. Godwin, "New Directions in Chinese Security Studies," in David Shambaugh, ed., *American Studies of Contemporary China*, Armonk, NY: M.E. Sharpe and Woodrow Wilson Center Press, 1993.

represent the central organizational, financial and intellectual tasks for the international community of PLA watchers - inside and outside government circles. Without a comprehensive effort to address these challenges, the limits of the community's understanding of the PLA will persist. This, in turn, can hinder development of effective government policies for addressing the role of the PLA as China's influence grows.

To address these challenges, this paper provides an empirical and conceptual basis for gaining control over these new information sources and for understanding how best to exploit them. This paper argues that open source materials on the Chinese military have proliferated both horizontally and vertically in recent years. Not only are more types of publications available, but they have become functionally specialized covering most aspects of PLA activities. These new materials will play a central role in improving our understanding of PLA organizations, policies, capabilities, and decision-making processes. Yet, the proliferation of commercialized and sensational publications about the PLA complicates the exploitation of these sources. As a result, the paper proposes a criteria for evaluating the authenticity, credibility and relevance of these new materials.

In outlining these arguments, the paper is divided into three parts. Section one describes the major features of the growth in new and newly available materials on the PLA. This section does not feign to be comprehensive but rather seeks to identify the major growth trends related to open source information on the PLA. Section two provides a "first cut" at assessing the usability of these materials. While much new information exists, determining its authenticity, credibility and relevance is central to conducting accurate assessments of all aspects of the Chinese military. The third section suggests previous and emerging research areas which have benefited from the use of open source materials. The conclusion offers a research agenda for future work on Chinese military publications.

Proliferation of Research Materials on the Chinese Military

The most striking aspects of the growth in research materials on the PLA in recent years are the breadth and depth of this trend. Both a horizontal and vertical proliferation of materials have occurred. Primary source materials on the PLA can be divided into 10 categories: yearbooks, research directories, general histories, memoirs, encyclopedias, dictionaries, books and monographs on specialized aspects of the PLA (e.g. strategy and doctrine, capabilities, political work), magazines and journals, newspapers, and electronics databases.[251] New and newly available materials have emerged in several of these categories. Furthermore, the new research materials have become functionally specialized and cover most aspects of the PLA such as: strategy and doctrine, tactics, defense industries, budget and finance, information warfare, political work, command and control, organization, logistics, weaponry, and legal work.

Two trends help to explain the expanding availability of open source materials on military topics: the PLA's professionalization drive and commercialization of the military publishing industry. These trends suggest that the growing literature on the PLA is not a systematic and highly coordinated denial and deception campaign by Chinese authorities.

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[251] This categorization draws on Shambaugh, "A Bibliographical Essay on New Sources for the Study of China's Foreign Relations and National Security," op. cit.

First, the accelerating professionalization of the PLA has generated a demand for research and writing about all aspects of the PLA's current and future operations. One of the key aspects of the professionalization effort has been reform of the professional military education (PME) system. A core element of PME reform is raising the level of knowledge of officers and technicians about a broad set of political and technical issues including doctrine, tactics, equipment, procurement and civil-military relations. Training, education and institutional reform require more diverse and more specialized research and writing to address the PLA's new missions. In addition, the professionalization campaign has allowed institutions such as the Academy of Military Sciences (AMS) to focus less on political work and more on conceptual and technical issues directly relevant to the PLA's missions.[252]

Second, the general commercialization of China's publishing industry *and* loosening of state control over most types of publications has clearly spilled over to the military realm. These trends accelerated in 1998 when the government dramatically scaled back its subsidization to state-run publishing houses. Military presses immediately exploited these developments by expanding the availability of military publications for profit making purposes. The growth in general-interest military books and magazines is a product of the commercialization trend. As a result, a wide variety of new materials are now published. Important new publications covering several categories are outlined below.

New Research Directories

The recent emergence of a small number of "research directories" addressing military issues will ease significantly the onerous process of researching the PLA through open source exploitation. These directories provide experts with an easy-to-use guide to some of the best Chinese sources on a wide variety of functional military issues. The most notable directory is the *Military Science Documents Information Reference Directory* (*Junshi Kexue Wenxian Xinxi Jiansuo Zhinan* 军事科学文献信息检索指南.) Published by the Academy of Military Sciences Press (*Junshi Kexue Yuan Chubanshe* 军事科学出版社) in August 2000, this 540-page, 28 chapter volume has four core attributes. The first three chapters outline the types, characteristics, meaning, and use of military science document information in China. These methodologically-oriented chapters provide unique insights on China's military-document creation and dissemination process. The remaining chapters provide bibliographic lists of materials covering 23 functional areas such as defense economics, military geography, military technology and equipment, and military law among others. These chapters are a treasure trove of new information on the Chinese military.

The book's third key attribute is an index of Chinese military databases (*junshi kexue changyong shujuku* 军事科学常用数据库). This list is indispensable for analysts

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[252] See James C. Mulvenon, *Professionalization of the Senior Chinese Officer Corps*, Santa Monica, CA: The Rand Corporation, MR-901-OSD, 1994; David Shambaugh, "China's Military in Transition," *China Quarterly*, June 1996.

searching for Chinese information on the PLA. Many of these databases have not been detailed before but presumably many (such as the ones controlled by the AMS library) are not open to non-Chinese researchers. Lastly, this reference directory provides an exhaustive appendix listing commonly used Western and Chinese websites on Chinese military topics. While the majority of websites are non-Chinese ones, the appendix provides a comprehensive compilation of key websites of Chinese military organizations and major Chinese military publications. Most notably, this appendix provides a unique list of personal Chinese web pages on military topics .[253]

A second valuable research guide is the *Survey of Core Chinese Journals* (*Zhongwen Hexin Qikan Yaomu Zonglan* 中文核心期刊要目总览) published in 2000 by the Beijing University Press (*Beijing Daxue Chubanshe* 北京大学出版社). This guide provides listings and rankings of "core" Chinese journals in numerous categories, including military-relevant topics. It is drawn from over 10,000 Chinese journals published between 1995-1997.[254] The rankings are based on sophisticated statistical analyses which quantify the number of articles abstracted or indexed by abstract/index journals, the number of articles cited by other relevant journals in the field, the mean abstracted times of each article, and the mean cited times of each article. In terms of military relevant publications, this book only ranks journals covering military-relevant industries such as aviation, aerospace, ordnance, and the nuclear industry. (An assessment of specific military publications is noticeably absent from the 2000 version.) These ratings of military industry journals provide researchers with a useful guide to the most common publications within China's notoriously opaque defense industrial establishment.

Encyclopedias and Dictionaries

In the late 1990s, new military encyclopedias and dictionaries came onto the research scene. In 1998, the Academy of Military Sciences in Beijing published an eleven volume *Chinese Military Encyclopedia* (*Zhongguo Junshi Baike Quanshu* 中国军事百科全书). Also in 1998, the Navy published a two volume *Naval Encyclopedia* (*Zhongguo Haijun Baike Quanshu* 中国海军百科全书). Both of these sets provide extensive historical data, organizational profiles, detailed personnel information, and definitions of key military terms and concepts. In 1995, Shanghai *Cishu* Press (上海词书出版社) published an Air Force dictionary (*Kongjun Da Cidian* 空军大词典) covering multiple categories of information such as strategy, campaigns, tactics and organization, equipment, maintenance, logistics and political work. Many Chinese dictionaries on military and defense subjects include far more information than merely definitions such as lengthy textual explanations of terms' usage and origin. Useful dictionaries on military topics include: *Current National Defense Technology Dictionary* (*Zuixin Guofang Keji Cidian*

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[253] For more details on Chinese military websites see Taylor Fravel's impressive contribution to this volume.

[254] This is the third edition of this book. The first and second editions were published in 1992 and 1996, presumably covering 1989-1991 and 1992-1994 respectively. All editions are available at major libraries in Beijing.

最新国方科技词典), PLA Press, 1993; and *Dictionary of Rocket and Missile Technology* (*Huojian Daodan Jishu Cidian* 火箭导弹技术词典), Ninghang Press, 1992; and *Military Medical Dictionary* (*Junshi Yixue Cidian* 军事医学词典), Shanghai *Cishu* Press, 1997. The latter provides interesting details on medical issues related to: nuclear weapons, radiation exposure, nuclear accidents, chemical and biological weapon (CBW) agents and dispersal methods, CBW delivery mechanisms and CBW defense technologies; it also lists major military medical events in China over the last 50 years.

Books

One of the areas of greatest growth has been the publication of specialized military books. A decade ago, most Chinese materials on the PLA discussed military topics in general terms. In recent years, books have increasingly become specialized and functionally differentiated. Some of the new categories of specialized books are worth highlighting. First, important texts on Chinese doctrine and strategy have emerged. Prominent examples include *Strategic Studies* (*Zhanlue Xue* 战略学*)* and *Campaign Studies* (*Zhanyi Xue* 战役学*)* published last year by China's National Defense University (NDU) Press (*Zhongguo Guofang Daxue Chubanshe* 中国国防大学出版社). Second, books by very senior military officials provide PLA watchers with useful, official views on key defense topics. Recent examples include Zhang Wannian, eds*., Contemporary Global Military Affairs and Chinese National Defense* (*Dangdai Shijie Junshi Yu Zhongguo Guofang* 当代世界军事与中国国防*)*, published by AMS Press in December 1999. Another useful compendium is *Contemporary China's PLA* (*Dangdai Zhongguo Renmin Jiefangjun* 当代中国人民解放军*)*, published by the Contemporary China Publishing House (*Dangdai Zhongguo Chubanshe* 当代中国出版社) in 1994. Such volumes are useful for their comprehensive treatment of official Chinese policies and assessments. These books provide analysts with "one-stop-shopping" on the PLA's public views on defense topics. In addition, the content of these types of books are useful in drawing comparisons with other PLA writings to assess internal debates.

Third, many PLA publishing houses have begun to release annual threat assessments of international and regional security. In 1999, NDU Press published *International Strategic Analysis 1998-1999* (*Guoji Zhanlue Xingshi Fenxi* 国际战略形势分析) and in 2000 AMS published *Asia-Pacific Security Strategy* (*Yatai Anquan Zhanlue Lun* 亚太安全战略论). The latter volume uniquely provides a theoretical and systematic analysis of military and economic trends in the Asia-Pacific region. NDU's *Asia-Pacific Security Strategy* notably includes a chapter assessing the challenges and opportunities for China in this region.

Fourth, functional specialization in military book publishing has extended to other sensitive topics such as arms control. Chen Xiaogong, a noted PLA Second Department officer, edited the internal circulation (*neibu*) *Arms Control and International Security Handbook* (*Junbei Kongzhi yu Guoji Anquan Shouce* 军备控制与国际安全手册) published by World Knowledge Press (*Shijie Zhishi Chubanshe* 世界知识出版社) in 1998. Several

recent publications have added to the growing body of literature on arms control. In December 2000, National Defense Industry Press (*Guofang Gongye Chubanshe* 国防工业出版社) published Liu Huaqiu's much anticipated *Arms Control and Disarmament Handbook* (*Junbei Kongzhi yu Caijun Shouce* 军备控制与裁军手册). This 13 chapter book (including four appendixes) is the most extensive open-source treatment of Chinese views on nuclear deterrence, nuclear weapons, arms control, and weapons of mass destruction nonproliferation issues.[255] Other serious publications on arms control and nuclear weapons issues include: *The Nuclear Cloud is Not Dissipating* (*Bu San de He Yin Yun* 不散的核阴云) published by NDU Press in 2000; and *The Tremors of the Nuclear Specter: Looking Back on and Pondering Nuclear Issues in the 21st Century*, (*He Youling de Zhendang: Ershiyi Shiji He Wenti Huigu yu Sikao* 核幽灵的震荡:二十一世纪核问题回顾与思考), published by NDU Press in 1999.

These four general categories only touch the surface of the *hundreds* of specialized books which cover virtually every aspect of the PLA. Issues such as tactics, defense industries, budget and finance, political work, command and control, organization, logistics, weaponry, and legal work/military crimes are being openly published in China. The number of new books in these categories is far too extensive to list here. However, establishing bibliographic control over them and properly exploiting this proliferation in books will dramatically augment our understanding of the PLA.

Monographs and Book Series

Several useful monograph- and book-series on military and international security topics began to emerge in the late 1990s. In 1999, AMS Press began publishing a series of master's student textbooks called *AMS Master's Student Teaching Series* (*Junshi Kexue Yuan Shuoshi Yanjiusheng Xilie Jiaocai* 军事科学院硕士研究生系列教材) which now covers over 20 military topics. This series is useful for understanding PLA educational materials but also provide insights into the PLA's thinking on sensitive topics such as China's relative military power. One volume in the series, called *Textbook on the Comparison Between China's Military Organization System and Foreign Countries (ZhongWai Junshi Zuzhi Tizhi Bijiao Jiaocheng* 中外军事组织体制比较教程), is devoted to assessing the differences between the armies, navies, air forces, and strategic nuclear capabilities of China and other countries.

Beginning in 1998, NDU press started publishing the *Zhongguo Junshixue Boshi Wen Ku* (中国军事学博士文库) series based on Ph.D. dissertations from AMS and NDU. The monographs are either openly available (*gongkai* 公开) or classified as "internal military circulation" publications. The publicly available monographs cover such issues as American military strategy after the Cold War, geostrategy, U.S. nuclear deterrence policies, and defense economics. *Junnei* monographs cover such issues as information

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[255] For an introduction to this book see "Guoji Junbei Kongzhi Mianling de Tiaozhan 国际军备控制面临新的挑战" [The Challenges Facing International Arms Control: A Talk with the Chief Editor], *Xiandai Junshi*现代军事 [CONMILIT], May 2001.

warfare operations, military personnel development, studies on the military college system, strategy and geography, and joint operations.

In 1997, the National Defense Industry Press began to publish a five book series called *Weapons and War Documentary Reference Books* (*Wuqi yu Zhanzheng Jishi Congshu* 武器与战争级实丛书). Written by experts from NDU and functional bureaus in the PLA, the series covers subjects such as nuclear weapons, chemical and biological weapons, space weapons, landmines and laser weapons. In 2000, the Long March Press (*Chang Zheng Chubanshe* 长征出版社) initiated a new series called National Defense Knowledge Education Series (*Guofang Zhishi Jiaoyu Congshu* 国防知识教育丛书) covering defense and national security topics. The first book in the series is called *Tracking the Development of China's Nuclear Weapons Testing Program* (*Zhongguo He Wuqi Shiyan Zhuizong* 中国核武器试验追踪). The series is edited by the PLA's Li Ju Tai and the contents are written by AMS master's degree candidates. This particular book provides interesting details on historical aspects of China's nuclear weapons testing program.

Other useful series include NDU's *High Technology and Military Affairs Series (Gaojishu yu Junshi Congshu* 高技术与军事丛书*)* which includes information on nuclear doctrine issues, and the PLA Press's *Service Branch History Series* (*Zhongguo Renmin Jiefangjun Bingzhong Lishi Congshu* 中国人民解放军兵种历史丛书).[256]

Magazines and Journals

The greatest proliferation of new and newly available materials on the PLA has occurred in the category of magazines and journals. A huge assortment of magazines and journals on military topics is now accessible to researchers and analysts. (See Appendix I). Similar to military books, Chinese military magazines and journals are also highly specialized. Magazines and journals covering eight functional categories can be identified. While some of the content consistently focuses on foreign military developments, magazines are a treasure trove of information about China. The main categories include:

- General military issues (e.g. *Junshi Wenzhai* 军事文摘);
- Naval developments (e.g. *Dangdai Haijun* 当代海军);
- Air Force topics (e.g. *Leida Bing* 雷达兵);
- PLA life and politics (e.g. *Junshi Jiaoyu* 军事教育);
- Military technical developments (e.g. *Zhongguo Junshi Tongxin Jishu* 中国军事通信技术);
- Defense economics and weapons development (e.g. *Junshi Jingji Yanjiu* 军事经济研究);
- Military history (e.g. *Junshi Lishi* 军事历史);

[256] The author is grateful to Iain Johnston for pointing out these sources.

- Provincial and regional military publications (e.g. *Xinan Minbing* 西安民兵)

Newspapers

Military newspapers remain a constant source of information on general developments within the PLA. *PLA Daily* (*Jiefangjun Bao*解放军报), *National Defense Daily* (*Guofang Bao* 国防报) and *PAP News* (*Wujing Bao*武警报) are basic reading for all scholars interested in general Chinese military and PAP developments. The newspapers produced by each military region offer additional and often more specific data on regional military activities. The relevant papers are: *Qianjin Bao* (Shenyang MR); *Qianwei Bao* (Jinan MR); *Renmin Jundui* (Lanzhou MR) *Renmin Qianxian* (Nanjing MR); *Zhanqi Bao* (Chengdu MR); *Zhanshi Bao* (Guangzhou MR); *Zhanyou Bao* (Beijing MR).[257]

Chinese defense industrial activities are also actively covered in several newspapers. *Hangtian Bao (*航天报*), Hegongye Bao (*核工业报*), Hangkong Bao (*航空报*), and Chuan bo Bao (*船舶报*)* provide information on developments in the aerospace, nuclear, aviation, and shipbuilding industries, respectively. Most are published biweekly by their respective industry. In 1995, COSTIND (subsequently the General Armaments Department) began publishing *Jungong Bao (*军工报*).* This weekly newspaper covers technical, organizational and political developments in the above industries as well as the ordnance and electronics sectors of China's defense industrial complex. Past issues for all of these newspapers dating back to 1987 are available at the National Library.[258]

Electronic Databases

The newest tools for analysts and scholars are electronic databases of military publications. The emergence of these databases will greatly expand access to current and past editions of key Chinese military publications. They also open up new methodological avenues for research on the Chinese military. First, the PLA Publications Office in Beijing sells complete sets of the *Liberation Army Daily* on CDROM. The set includes information dating back to 1956 and possesses searchable text functions (e.g. keyword, author, title, date, and author work unit). As of the late 1990s, only the University of Heidelberg possessed a continuous paper run of *Liberation Army Daily*. The CDROM set comes in two forms. One version provides a full graphic depiction of each newspaper; each disc covers a single year. A second version, with only text and no graphics, includes five years on a single disc. While the CDROM version of *Liberation Army Daily* is not classified, procurement by foreigners of all the CDROMS is not permitted. Chinese citizens are apparently freely permitted to purchase the CDROM set.

A second CDROM database set is called the *China Aeronautics and Missilery Abstracts* or CAMA (*Zhongguo Daodan yu Hangtian Wenzhai* 中国导弹与航天文摘). CAMA is produced by the Institute for Aeronautics Information (*Zhongguo Hangtian Gongye Keji Jituan Gongsi Xinxi Yanjiu Suo* 中国航天工业科技集团公司信息研究所) in

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[257] The author is grateful to James Mulvenon for providing this information.

[258] In some instances, back issues of these newspapers can be purchased from the publisher.

Beijing. This database, which covers aerospace and aviation industry developments, catalogues thousands of abstracts of research papers written by hundreds of Chinese experts. CAMA draws from close to 100 Chinese journals and covers several hundred technical areas. The abstracts are searchable by subject, periodical, research institute, and author. Two electronic versions of the database exist. The English version covers abstracts from 1994 to the present. The Chinese version covers abstracts from 1986 to the present. A printed version of CAMA existed from 1994 to 2000; all subsequent years are available on CDROM.

A third electronic information source is AMS's 11-volume military encyclopedia. The encyclopedia is available on CDROM with searchable text. The emergence of these databases opens several new avenues for research on the PLA. On a basic level, the extensive content in these databases provides opportunities to conduct historical research on issues previously inaccessible due to lack of reliable data. Perhaps more importantly, these electronic databases provide analysts of the PLA with opportunities to apply several quantitative and qualitative methodologies to examining China's military. The databases allow scholars to conduct extensive content-analysis, time-series analysis, and organizational-corporate source mapping of PLA capabilities, writings, organizations and personalities. For example, an MIT scholar used the *Liberation Army Daily* database to examine the PLA's use of the term "Lebensraum" (*shengcun kongjian*) in articles about China's naval strategies. This analyst used the database to determine the Chinese interpretation of the term, frequency of use, contexts of usage, and the specific office from which the term emerged.[259]

NET ASSESSMENT OF NEW AND NEWLY AVAILABLE INFORMATION ON THE CHINESE MILITARY

The emergence of these new and diversified research materials clearly presents the international community of PLA watchers with a multitude of new opportunities for understanding the Chinese military. These new research sources raise a number of complications as well. The principal task for scholars and analysts is to assess the authenticity, credibility and relevance of new and newly available information on the PLA.

An increasing amount of unofficial and questionable *information* and *opinions* about military issues exist in open Chinese literature. This information can be divided into three general categories. First, many of China's new, general interest military magazines and some books are mainly commercial ventures aimed at China's sizable audience of military buffs. Prominent examples of magazines include: *Military Digest* (*Junshi Wenzhai* 军事文摘) and *Military Prospects (Junshi Zhanwang* 军事展望*)*. On one level, much of the information in these publications focuses on foreign weapons systems, which is of limited utility to PLA watchers. On a second level, articles on Chinese capabilities or activities are often based on information of questionable credibility. While some data is useful and accurate, others bits are sensationalized accounts of new Chinese

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[259] Eric Heginbotham, "Blue Lebensraum: The PLAN and the Origins of Strategic Thought in China," MIT Security Studies Program Working Paper, 2000. The author is grateful to Eric Heginbotham for providing this information.

military systems or supposedly leaked Chinese military documents aimed primarily at boosting magazine sales. A classic case occurred in Spring 2000 when *Haowang Dao* weekly published an 16-page edition which outlined a series of strategies for invading Taiwan. These included sending a fleet of 200,000 fishing vessels across the Taiwan strait as well as using both laser weapons and nuclear weapons to prevent U.S. interference. The Hong Kong press reported the story and it subsequently received international attention.[260] In another case, a Chinese publication claimed that China could successfully invade Taiwan during the hurricane season -- when Taiwanese planes are grounded.

A second category of questionable information are publications by Chinese military officers which do not possess official endorsement by senior military officials or necessarily reflect mainstream PLA thinking. The most prominent and recent example is the February 1999 release of *Unrestricted Warfare* (*Chao Xian Zhan*超限战) by Qiao Liang and Wang Xiangsui.[261] The PLA Arts and Literature Press (*Jiefangjun Wenyi Chubanshe* 解放军文艺) published the book, and it was even reviewed in *China Youth Daily* (*Zhongguo Qingnian Bao* 中国青年报), the paper of the CCP Youth League. This book provides an extensive discussion of a variety of "non-traditional" means for inferior military powers such as China to defeat stronger ones (i.e. the United States) during "high-tech war." The tactics discussed include: hacking into websites, targeting financial institutions, terrorism, using the media, and conducting urban warfare. The value of this book is questionable. One the one hand, it reflects the PLA's growing focus on using asymmetric means to counter superior U.S. military capabilities. In this sense, such books are useful in determining the prevalence and acceptability of particular opinions. They also help to identify institutional or group positions on sensitive issues. Yet, on the other hand, some of the military tactics proposed in the book, such as the use of terrorism and urban warfare, are not likely endorsed by PLA officials as viable options for military planners. These authors of *Unrestricted Warfare* are both Political Department officials with no operational planning experience. Thus, the contents should not be viewed as official PLA warfighing doctrine.

In recent years, the rise of Chinese military pundits has created a third category of unofficial and questionable information on Chinese military thinking. Officers such as

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[260] The *Haowang Dao* weekly is published by the official *Science and Technology Digest* in Beijing. The paper was closed for two weeks following this incident. Jasper Becker, "PLA Newspaper Details Strategies to Liberate Taiwan," *South China Morning Post*, 20 March 2000; Jasper Becker, "PRC Newspaper Closes After Leaked Taiwan War Plan," *South China Morning Post*, 23 March 2000.

[261] Qiao Liang is assistant director of the production office of the air force's political department and holds the rank of senior colonel in the air force. He is the author of several books on military theory including: *A Discussion of Military Officer Quality* [*Junguan Suzhi Lun* 军官素质论]; *Viewing the Global Military Big Powers* [*Shijie Junshi Lieqiang Bolan* 世界军事列强波澜]; and *A Listing of the Rankings of Global Military Powers* [*Quanqiu Junli Paihang Bang*全球军力排行榜]. Wang Xiangsui joined the army at the end of 1970. He successively assumed the positions of political instructor, group political commissar, section deputy head, regiment political commissar, and division deputy political commissar. Presently, he works in the Guangzhou Military Region Air Force Political Unit and holds the rank of senior colonel. He has written such books as *A Discussion of Military Officer Quality*; *Viewing the Global Military Powers*; and *A Record of Previous Major Global Wars* [*Shijie Lici Dazhan Lu* 世界历次大战]. This biographical data is drawn from the last section of *Unrestricted Warfare*.

Zhang Zhaozhong have begun publishing books addressing Chinese threat perceptions and world military developments. The apparently high demand for these books partially explains their proliferation in recent years. Zhang is senior colonel in the PLA and a lecturer at NDU. His publications include:

- *How Far is War from Us?* (*Zhanzheng Li Women You Duo Yuan* 战争离我们的多远), PLA Press, 1995
- *Who is the Next Enemy?* (*Xia Yi Ge Mubiao Shi Shei* 下一个目标是谁), China Youth Press, 1999
- *Discussing National Defense* (*Huashuo Guofang* 话说国防), NDU Press, 2000
- *Net War* (*Wangluo Zhanzheng* 网络战争), PLA Arts and Literature Press, 2000

In contrast to category two above, these books are endorsed by highly credible military institutions like China's NDU and have approval by the leaders of these organizations. In the preface to *How Far is War from Us?* Zhang claims to have the endorsement of NDU's president, political commissar as well as the University's vice president and vice political commissar. Another example is Jin Rongren's 2000 *Who Will Defeat the U.S.?* (*Shei Lai Da Bai Meiguo* 谁来打败美国). Jin is a senior colonel in the PLA Air Force and served as deputy director of NDU's teaching and research office on military forces. These credentials and endorsements aside, the reliability and usability of these materials remain questionable. According to two senior AMS military experts, Zhang Zhaozhong "knows everything but national defense topics." To be sure, the expanding demand for these types of books suggests broad interest within Chinese popular culture about national security and national defense issues.

Toward A Criteria for Evaluating Chinese Military Publications

As a result, exploitation of new and newly available source materials requires a rigorous methodology for assessing authenticity, credibility and relevance. Several criteria are outlined below, but these standards do not collectively apply to all categories of publications. The criteria include:

- publisher (for books, encyclopedias and dictionaries)
- *zhuguan* (主管) and *zhuban* (主办) for magazines and journals
- author
- author's workgroup (*danwei* 单位)
- article content
- production cycles (this is particularly relevant to newspapers)

The publisher is the first and most important standard in evaluating military-related books. This paper identifies three general categories of publishers of military topics. To be sure, categorizing Chinese publishers is an inherently difficult task because many exceptions exist. The following three categories are meant to serve as a general guide. The top-tier Chinese military publishers are AMS Press, NDU Press, and National Defense Industry Press (*Guofang Gongye Chubanshe* 国防工业出版社). They mainly

publish on military topics and consistently print high quality books, reference materials, monographs and magazines.

Second tier publishers are ones which focus on military topics but whose content is increasingly based on questionable research, reflects minority positions and is of limited value. This tier includes: PLA Press,[262] PLA Arts and Literature Press, and Long March Press. The first two have become more commercialized in recent years and their publication of high quality military books and periodicals has declined. These presses are often used by military officials to publish personal views on military developments. Some prominent examples include *Unrestricted Warfare* and *Who Will Defeat the U.S.?* The content of these books is vetted for factual accuracy but not necessarily judgments. The Long March Press is run by the PLA's General Political Department (GPD). It has also become commercialized in recent years, and its content has suffered accordingly. A classic example is Long March's propagandistic *Tracking the Development of China's Nuclear Weapons Testing Program*. This book provides some interesting historical details amid descriptive accounts of "the heroism and sacrifices" of China's nuclear testing establishment. Certain defense industries publishers such as the Ordnance Industry Press (*Bingqi Gongye Chubanshe* 兵器工业出版社) also fall into the second tier of publishers. They print some useful works on military-technical issues[263] but increasingly focus on profitable magazines with glossy pictorials of foreign weapons systems.

A third "catch-all" category includes a wide variety of general interest presses which print some books and materials on military topics. But the quality of research is highly variable and the credibility of the content is questionable. These presses generally focus on historical, theoretical and cultural aspects of the PLA as well as memoirs. This category includes: China Wenli Press, Hubei Press, Xinjiang Press, Dongfeng Press, China Youth Press, People's Press, Sichuan People's Press, Qingdao Press, World Knowledge Press, Shanghai Press, Shanghai People's Press, Communist Party School Press, Xinhua Press, and Guangzhou Press.[264]

While identifying publishers is key to evaluating military books, the *zhuguan* and *zhuban* are equally important to assessing the authenticity and credibility of periodicals. The *zhuguan* is the organization which oversees and authorizes the periodical; the *zhuban* is the specific office which produces it. (See Appendix I.) The extent to which the *zhuguan/zhuban* coincide with the journal's topical focus can signal the authenticity and/or relevancy of its content. The content of the periodical (e.g. military communications technology) should coincide with the *zhuban/zhuguan* (e.g. PLA Communications Engineering Institute/PLA General Staff 63rd Research Institute.) The *zhuguan/zhuban* are particularly important in evaluating the credibility of new military periodicals. For example, the publisher of *ZhongWai Junqing Cankao* (中外军情参考) is

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[262] Long March and *Kunlun* Press are both linked to the PLA and most of their publications address military issues. Kunlun Press, for example, focuses on PLA literature. Long March press is part of the GPD.

[263] One interesting example is *The Economics of Missile Engineering* [*Daodan Shiyong Gongcheng Jingji* 导弹使用工程经济] published in 1993.

[264] This list is not comprehensive and many more presses publish military-related books. This category is potentially endless.

the World Knowledge Press, which is not known for its military expertise. (It is run by the Foreign Ministry.) This journal is clearly a money-maker for the publisher, and its content should be evaluated with skepticism. In other cases in which the credibility of the journal is not questionable, the *zhuguan/zhuban* combination provides a useful guide to important organizations in the PLA. In these cases, the *zhuban/zhuguan* can assist in profiling and mapping PLA institutions.

The author(s) of military-related books, periodicals, and other publications provide a third important standard to evaluate the credibility and relevance of research materials. Certain authors are known for expertise (or lack there of) on specific topics. Identifying authors, however, is especially difficult because of the relative opacity and classification of China's military publishing system. Most of China's military publications are not openly available. This problem is further complicated by the limited access for Western experts to Chinese military academics. Meeting new scholars (especially ones that do not speak English) is difficult and often subject to trends in bilateral relations.[265] In addition, identifying the author's work unit provides key data in evaluating the authenticity and reliability of books, magazines and journals on military topics. A growing number of military publications provide this information. As noted above, the authors of *Unrestricted Warfare* are both political officers but were writing about strategic and operational doctrine.

Furthermore, the content of publications offers an obvious indication of credibility and relevance. Evaluating content of Chinese books and periodicals faces two broad constraints. First, in general terms, the writing and research methodologies of Chinese scholars differ significantly from Western traditions. Many Chinese writings are highly descriptive, emphasize history and specific historical data, and are quick to offer broad generalizations based on limited analysis. Also, many Chinese books and articles use few references which raises additional questions about authenticity and credibility. On certain issues, such as information warfare, most open-source PLA books and articles are plagiaristic renderings of Western writings. Second, Chinese authors cannot challenge the official CCP or PLA position on military and political issues. Thus, authors are limited to debating the optimum means and speed to realize official objectives. In such a restricted environment, writers only have room to maneuver and can be analytical on specific issues which are far from the general guidelines established by CCP and PLA authorities.[266]

A final, useful tool in examining military reference materials is understanding their publication cycles. This mainly applies to newspapers. The *Liberation Army Daily*, for example, was for decades viewed as the officially sanctioned mouthpiece of the Chinese military. In recent years, the paper has begun to include weekly inserts with personal views of senior military officials.[267] *Liberation Army Daily* also carries inserts

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[265] Electronic databases will greatly assist the author identification process; patterns of article content, journal placement and workgroup can easily be identified using the *PLA Daily* or CAMA databases.

[266] The author is grateful to Dr. Jing-dong Yuan for his insights on the general attributes of Chinese writings and the constraints facing Chinese writers of military issues.

[267] One prominent example includes, Zhu Chenghu, "Safeguarding the One-China Policy is the Cornerstone of Peace in the Taiwan Strait -- Splitting the Motherland by 'Taiwan Independence' Elements

on a variety of technical and international issues. Tracking the content of these inserts provides useful data to PLA watchers. On Mondays, the *Liberation Army Daily* includes an insert called "international developments weekly" (*shishi zhoukan*时事周刊) covering international developments; on Tuesday a page is devoted to discussions of information warfare; and the Wednesday edition includes an insert called "military science and technology" (*junshi keji* 军事科技).

Overall, these six criteria can provide a useful yardstick for PLA watchers to evaluate the authenticity, credibility and relevance of the flood of new Chinese materials coming on the scene. Using these criteria will help analysts and scholars to identify useful research materials and to separate out the growing amount of unreliable blather. Indeed, without using a strict measure to assess the authenticity, credibility and relevancy of the mass of new information on the PLA, gaining bibliographic control and properly exploiting these materials will become needlessly gargantuan tasks.

LEARNING FROM CHINESE OPEN SOURCE MATERIALS?

Selectively and carefully exploiting the proliferation of new source materials on the Chinese military can and has yielded significant fruit for scholars and analysts of the PLA. Information on several functional areas can be gleaned from open-source materials. This paper suggests five subjects areas which have benefited from the increasing availability of open source information. These include: Chinese military doctrine and strategy; PLA life, politics, and personalities; military exercises and operational training; defense economics and weapons development; and PLA force structure, capabilities and force planning. To differing degrees, open source materials provide useful information on these topics.

Doctrine with Chinese Characteristics

For years open source publications offered only general insights into the PLA's military strategies and operational doctrines. Chinese writings provided broad descriptions of national military strategies and contingencies such as "People's War," "active defense," "local war under modern, high-tech conditions" and the importance of information warfare. Yet, Chinese articles and books seldom discussed operational details of these "doctrines," their application to specific contingencies, or China's ability to implement them. In recent years, publications have emerged which open up avenues for better understanding Chinese doctrines and military operations. The recent publication of the *Military Encyclopedia* and the *Navy Encyclopedia* are notable in this regard. Both provide PLA watchers with the opportunity to understand the baseline concepts which form the corporate intellectual foundation of Chinese strategic and operational doctrine. These sources are a guide to the PLA's language of war fighting and permit PLA watchers to begin to understand how the Chinese think about strategic and operational doctrine. These volumes also allow a comparison of terms *across military branches*.

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is Bound To Provoke a War," *Jiefangjun bao*, 28 February 2000. Senior Colonel Zhu was formerly Director of the Institute of Strategic Studies of China's National Defense University.

Furthermore, the 2000 publication of *Campaign Studies* offered - for the first time - important insights into PLA operational doctrine. One U.S. PLA watcher called this book "the Rosetta stone" of Chinese campaign operations. Written by a consortium of military scholars from across the PLA, this book offers unique details on theater level operations. In stark contrast to other publications, *Campaign Studies* discusses specific operational concepts, the means to carry out operational goals such as the use of ballistic missile strikes and blockades, and the challenges the PLA faces in carrying out its goals. The book also importantly identifies *in an operational setting* the PLA's emphasis on blending military and psychological goals in war fighting such as breaking the morale and will of the Taiwanese people.[268]

Open source materials have proven useful in shedding light on the traditionally opaque issue of Chinese strategic nuclear doctrine. Research by Iain Johnston in the mid-1990s highlighted the utility of such materials in revealing debates within the military academic community about the future direction of China's nuclear doctrine and nuclear force structure.[269] Among other things, Johnston argued that a core of Chinese military strategists supported moving from a basic minimal deterrent posture to a limited deterrent, following improvements in China's nuclear force structure. Regardless of the influence of these thinkers in policymaking circles, this research updated and overturned the claims of John Lewis and others. that China's nuclear and missile development were exclusively driven by technological determinism and not doctrinal requirements. The growing Chinese writings and research on nuclear arms control and disarmament issues offers additional opportunities to understand Chinese views on nuclear weapons, nuclear doctrine and nuclear modernization. In the past few years, Chinese writings have clarified Beijing's official position on deterrence which stated that China "opposed the policy of nuclear deterrence." The Chinese now publicly oppose "the policy of nuclear deterrence *based on the first use of nuclear weapons*." The journals of the Second Artillery's research institutes can offer insights on these issues as well. Liu Huaqiu's newly published handbook on arms control also provides extensive treatments of nuclear strategy and deterrence theories.

PLA Life, Politics and Personalities

Chinese source materials consistently provide useful information on PLA life, politics, and personalities. Publications such as *PLA Daily*, *National Defense* magazine, and various regional military papers regularly include data on the implementation of new political campaigns and movements within the military. For example, the PLA's "three defenses and three attacks" strategy was first publicly identified in the *PLA Daily*.[270] These sources are also regular outlets for information on new military laws and

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[268] This discussion of *Campaign Studies* is drawn from conversations with several U.S. PLA watchers familiar with the book. Also see Thomas J. Christenson, "Posing Problems Without Catching Up: China's Rise and Challenges for U.S. Security Policy," *International Security*, Spring 2001, pp. 5-40.

[269] Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security*, Winter 1995/96; Alastair Iain Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence Versus Multilateral Arms Control," *China Quarterly*, June 1996.

[270] The author is grateful to Lt. Col. Remo Payson, former Assistant Air Attaché U.S. Embassy Beijing, for this insight.

regulations, uniform changes, and the results of party, government and military meetings. Personnel information and changes can also be tracked by persistently and meticulously reading a variety of open military periodicals, especially at the provincial level. In April 2000, for example, *Military Digest* devoted 60 pages to biographical profiles of several senior military officials like Gen. Yang Guoliang (Second Artillery Commander), Lt. Gen. Sui Ming tai (Second Artillery Political Commissar), Gen. Li Xin Liang (Shenyang MR), Lt. Gen. Du Tie Huan (Beijing MR), Lt. Gen. Chen Bing de (Nanjing MR), Gen. Fang Zu qi (Nanjing MR), and others. Such sources can assist and add to the annual updating of the bible of PLA personalities, the *Directory of PRC Military Personalities*.

Military Exercises and Operational Training

A focused and dedicated use of publicly available Chinese newspapers and journals can yield detailed information on specific Chinese military exercises. The PLA's September 1999 joint amphibious exercise in the Nanjing and Guangzhou MRs provides a useful example. An analysis of several editions of *Liberation Army Daily*, *Shenzhen Daily*, *Zhanshi Daily* (Guangzhou), *National Defense Daily* and the journal *Tank and Armored Vehicles* (*Tanke Zhuangjia Cheliang* 坦克装甲车辆) revealed data on this exercise. These open sources likely publicized this information because a central goal of the exercise was to verify progress in force modernization and demonstrate to the U.S. and international media the PLA's readiness to use force against Taiwan.

These Chinese newspapers and journals provided details on the goals, characteristics, operations, and equipment used in the exercise. These sources highlighted that the key aspects of this exercise were the use of new tactics, combat methods and equipment. This was the first joint amphibious exercise since the PLA issued its "Joint Operation Procedure and Operational Guidelines." Thus, the exercise sought to operationalize new combat methods (such as counter-air attack and counter reconnaissance) and to utilize joint operation command systems and countermeasures against hostile high-tech weapons. Special emphasis was placed on using automated command centers, digitized artillery command centers, and new tactics for air defense, counter-reconnaissance and electronic warfare. In the 1999 exercise, the PLA also importantly utilized civilian ships for amphibious tasks, special forces units and tactical fire support from the Second Artillery. To be sure, there are limits to using open sources in evaluating military exercises. Such reports provide useful details about the scope of the exercise, but they offer little assistance in assessing the PLA's actual operational performance during the exercise.

Defense Economics and Weapons Development

Research on Chinese military economics and weapons development has benefited greatly from open source materials. Seminal works by John Wilson Lewis, Hua Di and Xue Litai used an impressive collection of Chinese books, magazines and officials documents to detail the development of China's nuclear weapon, ballistic missiles, and

nuclear submarine programs.[271] Recent work on China's defense industrial capabilities has also profited from access to Chinese materials. As Bates Gill noted in his review of research on Chinese military-technical developments, studies in the 1990s on China's defense industrial complex substantially benefited from access to factory and investor data detailing defense conversion activities on the mainland.[272] Many Western analyses have also utilized information from trade industry shows in Beijing and Zhuhai to gain additional information about the organization, operation and products of key defense sectors like aerospace and aviation. Some of the most consistently useful source materials on military R&D are newspapers and magazines published by specific defense industrial organizations. The nuclear, aerospace, aviation, and shipbuilding sectors each produce biweekly papers and some also publish magazines (e.g. *Zhongguo Hangtian* 中国航天and *Bingqi Zhishi* 兵器知识). These materials provide data on technical, political, personnel and organizational developments within each industry. For example, the *He Gongye Bao* published a special glossy, color edition in October 1997 which outlined new nuclear export control guidelines and commitments to the IAEA as part of its effort to improve nuclear nonproliferation controls. In July 1999 another special edition provided extensive bibliographic profiles of all the major leaders within China's nuclear industry following its structural bifurcation. Publications by all of the defense sectors helped to clarify the results of the defense industrial reorganization in mid-1999. The names of the 10, new defense group corporations and the distribution of responsibilities among them were identified by articles and advertisements in industry periodicals.

However, very little Western research on Chinese defense industrial issues and military economics has exploited the plethora of quality open source Chinese materials on these topics. The major Chinese journals addressing these areas include: *Military Economic Research (Junshi Jingji Yanjiu* 军事经济研究*), Military Standardization (Junyong Biaozhunhua* 军用标准化*), Chinese Defense Conversion (Zhongguo Junzhuanmin* 中国军转民*), and Military Finance (Jundui Caiwu* 军队财务*).*(See Appendix I.) In addition, several new books with detailed treatments of military finance and defense economics have emerged in the last two years. In 1999, NDU Press published *Military Expenditure Theory* (*Junfei Lun* 军费论) and *An Introduction to the Economics of National Defense* (*Guofang Jingji Xue Gailun* 国防经济学概论). In 2000 NDU Press, as part of the doctoral dissertation series, printed an unusually critical assessment of China's defense economy called *On Unequilibrium of the Defense Economy: A Systematic Analysis of the Supply-Demand Relationship of China's Defense Economy* (*Guofang Jingji Fei de Yanjiu: Dui Zhongguo Guofang Jingji Gong-Qui Guanxi de Zhiduxing*

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[271] John Wilson Lewis and Xue Litai, *China's Strategic Seapower: The Politics of Force Modernization in the Nuclear Age,* Stanford: Stanford University Press, 1994; John Wilson Lewis and Xue Litai, *China Builds the Bomb,* Stanford, CA: Stanford University Press, 1988; Lewis and Hua, "China's Ballistic Missile Programs: Technologies Strategies and Goals," *International Security*, Fall 1992.

[272] Bates Gill, "Chinese Military-Technical Developments: The Record for Western Assessments," in James C. Mulvenon and Andrew N.D. Yang, eds., *Seeking Truth From Facts: A Retrospective on Chinese Military Studies in the Post-Mao Era*, Santa Monica, CA: RAND Corporation, CF-160-CAPP, 2001.

Kaocha 国防经济非的研究*:*对中国国防经济供求关系的制度性考察). Yet, very little, if any, information from these books or journals is found in the leading works on Chinese defense industrial issues.[273] One journal in particular, *Military Economics Research*, has for years provided extensive research on defense industrial reorganization, procurement reform, the relationship between defense reform and arms exports, defense conversion strategies, and military budget management. The contents of this journal can serve as a broad guide to internal debates about defense industrial issues. For example, in the past year, many Chinese analyses have focused on the impact of China's WTO accession on specific defense industrial sectors and the role of Chinese defense industries in the "western development" campaign.

Current PLA Force Structure, Capabilities, and Force Planning

The issues least discussed in detail in Chinese open publications are PLA force structure, current capabilities and force planning. The PLA's longstanding emphasis on cloaking capabilities as a means of deterrence has meant that little useful or reliable data is available on the above issues. Yet, in recent years as China's publishing industry has expanded, a growing body of relevant information is available through careful and systematic exploitation of Chinese magazines and newspapers. First, in terms of force structure, many U.S. PLA analysts used a wide mix of open publications to decipher the new military unit code designator (MUCD) system. Two long-time PLA watchers, Harlan Jencks and Ellis Melvin, used open publications to unravel the Second Artillery's MUCD structure down to the brigade level.

Second, regarding military capabilities, limited nuggets of information are available in open sources. Several articles from *Hangtian Bao* and *Jungong Bao* running from 1996 through 2000 provided details on Chinese efforts to develop microcomputers with missile and satellite applications. The reports detailed the organizations and personalities involved in these activities, such as the Chinese Aerospace Corporation's development of a new center for aerospace computer technology development. Some Chinese source materials also provide technical information on specific weapons systems. In September 2000, the journal *Fire Control Radar Technology* (*Huokong Leida Jishu* 火控雷达技术) published an article which examined the performance requirements of China's medium/low-altitude anti-aircraft artillery radar (MLAR) systems. The article detailed China's use of the system and even suggested improvements in China's MLAR capabilities. The section on improvements made surprisingly detailed suggestions including: upgrades in anti-jamming, anti-low altitude target defense, fire control systems, small target protection, target search, and target tracking. On a broader level, the article provided insights on Chinese thinking about the functions, characteristics, and constraints of air defense operations. In addition, numerous informational nuggets on Chinese capabilities can be found by regularly trawling military publications. Some

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[273] Notable exceptions include some of the chapters in Jorn Brommelhorster and John Frankenstein, *Mixed, Motives, Uncertain Outcomes: Defense Conversion in China*, Boulder, CO: Lynne Reinner Publishers, 1997. Recent work on PLA business activities also includes data from these sources. See James Mulvenon*, Soldiers of Fortune: The Rise and Fall of the Chinese Military-Business Complex*, 1979-1999, Armonk, NY: M.E. Sharpe, 2001.

examples include stories on: PLA naval air force capabilities, PLA marine capabilities, an "anti-nuclear professional support team," interviews with weapons designers, and anecdotal accounts of PLA experiences operating various weapons systems.

Third, Chinese sources can provide broad insights into force planning debates and discussions within the PLA. Interviews by senior Chinese military officials printed in reputable magazines and newspapers provide some guidance on this issue. Also, the balance of articles in key journals serves as another, general metric of these debates. For example, the explosion of articles on submarines and submarine warfare in *Naval and Merchant Ships* (*Jianchuan Zhishi* 舰船知识) in recent years suggests a shift in planning assumptions about naval operations. In the past, many of these articles focused on carrier operations and defense. Interestingly, this journal has also begun to reprint "chat-room" discussions about "submarines vs. aircraft carriers" in each issue.[274]

CONCLUSIONS

The field of PLA studies and the related field of Chinese national security and foreign policy studies are rife with new research opportunities. The proliferation of new source materials across categories of publications combined with the growing functional specialization of Chinese writings has opened new pathways to gather information and to better understand developments related to Chinese military policies, capabilities and intentions. These trends present both opportunities and challenges to the international community of PLA watchers. The opportunities are obvious in terms of providing PLA watchers with dramatically increased access to high quality information and data compared with previous years. Scholars and analysts of the PLA can exploit this material in fresh ways as well by applying tried and true methodologies to assess and manipulate this information. New avenues for building on existing knowledge and overturning conventional wisdom now exist.

Herein lie the challenges. Gaining adequate bibliographic control over this growing mass of source material and properly exploiting it are not trivial tasks. Both require substantial and sustained bureaucratic and financial commitments. The current ad-hoc, unsystematic, and apparently uncoordinated collection and exploitation of this material complicate this picture. Such unsystematic efforts complicate the crucial task of evaluating the accuracy of new information and limit the possibilities for exploiting the data. This is occurring at a time when making such judgments is more difficult but vital to properly exploiting new materials.

The challenges and opportunities suggest a rich agenda for future research and conferences. First, PLA watchers with functional specializations could begin to identify critical gaps in knowledge about particular aspects of the PLA. Open source materials could then be targeted to evaluate their utility in filling these informational gaps. This paper suggested some areas in which this is already occurring such as regarding Chinese doctrine and strategy. Yet, more comprehensive work needs to be done. Second, the field would benefit from a systematic analysis of the Chinese classification system as it relates to military publications. What are the differences in content among *gongkai*, *neibu* and *junnei* materials? In analyzing specific issues such as force planning or military budgets,

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[274] The author is grateful to Eric Heginbotham for this information.

do these classifications make a difference. Ideally, an analyst with an extensive knowledge of a sub-specialty could analyze three types of documents on the same issue in order to assess their relative value. Lastly, much more work needs to be done on the Chinese military publishing system. Little is known about the operation and organization of this system. As this paper suggests, the system is undergoing dramatic structural and financial changes which are reflected in the production of diverse and increasingly unofficial content. An improved understanding of this system will help the international community of PLA watchers to more accurately evaluate the proliferation of open source materials. This robust agenda should be pursued so as to further the evolution of a research field which is becoming more important to both U.S. and international security.

Chinese Military Journals

General Military Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
National Defense	Academy of Military Science			
国防	中国解放军军事科学院			
Guofang	Zhongguo Jiefangjun Junshi Kexueyuan			
Comments/ Specifications:	*For popular consumption.*			
National Security Bulletin	Ministry of State Security	Ministry of State Security, Political Department		
国家安全通讯	国家安全部	国家安全部政治部		
Guojia Anquan Tongxun	Guojia Anquan Bu	Guojia Anquanbu Zhengzhi Bu		
Comments/ Specifications:				
Journal of the PLA Foreign Language Institute	PLA Foreign Language Institute			
解放军外语学院学报	解放军外语学院			
Jiefangjun Waiyu Xueyuan Xuebao	Jiefangjun Waiyu Xueyuan			
Comments/ Specifications:				

General Military Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Military Encyclopedia	Academy of Military Science	Military Encyclopedia Research Department		
军事百科	**中国解放军军事科学院**	**军事百科研究部**		
Junshi Baike	Zhongguo Jiefangjun Junshi Kexueyuan	Junshi Baike Yanjiu Bu		

Comments/ Specifications:

Military World Pictorial		China Defense Science and Technology Information Center		
军事世界画刊		**中国国防科技信息中心**		
Junshi Shijie Huakan		Zhongguo Guofang Keji Xinxi Zhongxin		

Comments/ Specifications: *For popular consumption.*

Military Digest		Second Academy of the China Aerospace Corporation	1993	
军事文摘		**中国航天工业总公司二院**		
Junshi Wenzhai		Zhongguo Hangtian Gongye Zonggongsi Eryuan		

Comments/ Specifications: *For popular consumption.*

Military Academic Research	Academy of Military Science			Neibu
军事学术	**中国解放军军事科学院**			
Junshi Xueshu	Zhongguo Jiefangjun Junshi Kexueyuan			

Comments/ Specifications: *Central Military Commission (CMC) approved internal military publication (*中央军委批准全军性内刊物 *）*

General Military Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Military Prospect	PLA Armored Forces Engineering Academy	PLA Military Planning Association Study Group on Future Military Affairs		
军事展望	**中国人民解放军装甲兵工程学院**	**中国人民解放军军事统筹学会军事未来研究会**		
Junshi Zhanwang	Zhongguo Renmin Jiefangjun Zhuangjiabing Gongcheng Xueyuan	Zhongguo Renmin Jiefangjun Junshi Tongchou Xuehui Junshi Weilai Yanjiuhui		

Comments/ Specifications: *For popular consumption.*

World Military Affairs				
世界军事				
Shijie Junshi				

Comments/ Specifications: *No publisher indicated; Widely available in most post office kiosks; For popular consumption.*

World Military Review	Academy of Military Science	Foreign Military Affairs Research Department		
外国军事学术	**中国人民解放军军事科学院**	**外国军事研究部**		
Waiguo Junshi Xueshu	Zhongguo Renmin Jiefangjun Junshi Kexueyuan	Waiguo Junshi Yanjiu Bu		

Comments/ Specifications:

Chinese Military Science	Chinese Military Science Association; Academy of Military Science	Academy of Military Science Editorial Department		
中国军事科学	**中国军事科学学会；中国人民解放军军事科学院**	**中国军事科学编辑部**		
Zhongguo Junshi Kexue	Zhongguo Junshi Kexue Xuehui; Zhongguo Renmin Jiefangjun Junshi Kexueyuan	Zhongguo Junshi Kexue Bianji Bu		

Comments/ Specifications:

General Military Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Chinese and Foreign Military Situation Magazine	World Knowledge Press	Chinese and Foreign Military Situation Reference Collection Committee		
中外军情参考	世界知识出版社	中外军情参考丛书编委会		
Zhongwai Junqing Cankao	Shijie Zhishi Chubanshe	Zhongwai Junxing Cankao Congshubian Weihui		

Comments/ Specifications: *For popular consumption.*

Naval Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Contemporary Navy **当代海军** **Dangdai Haijun**	Naval Political Office (Beijing) 海军政治部（北京） Haijun Zhengzhi Bu (Beijing)			
Comments/ Specifications:				
Journal of Dalian Naval Academy **海军大连舰艇学院学报** **Haijun Dalian Jianting Xueyuan Xuebao**	Dalian Naval Academy 海军大连舰艇学院 Haijun Dalian Jianting Xueyuan		1978	Junnei
Comments/ Specifications:	*-Tentative analysis of hit probabilities of ultrasonic anti-ship missiles* *-Forms and countermeasures of NBC*			
Journal of Naval Academy of Engineering **海军工程学院学报** **Haijun Gongcheng Xueyuan Xuebao**	Naval Academy of Engineering (Wuhan), Political Department 海军工程学院,（武汉）政治部 Haijun Gongcheng Xueyuan (Wuhan), Zhengzhi Bu		1977	
Comments/ Specifications:	*Highly Technical.* *Articles: "Analysis of influence of warship reliability on maintenance costs or basis of system connected analysis"; "Analysis of risk management and contract type in warship development"; "Research of ship based weapon systems."*			

Naval Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Naval Academic Research		Naval Command Institute		Junnei
海军学术研究		海军指挥学院		
Haijun Xueshu Yanjiu		Haijun Zhihui Xueyuan		

Comments/ Specifications: *Topics: military theories; stories of campaigns; postgrad education and training; ideological and political construction; news briefs*

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Naval Education	PLA Naval Command Military Training Department (Wuhan)			
海军院校教育	中国解放军海军司令部军训部(武汉)			
Haijun Yuanxiao Jiaoyu	Zhongguo Jiefangjun Haijun Silingbu Junxun Bu (Wuhan)			

Comments/ Specifications:

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Naval Electronic Countermeasures		China Shipbuilding Corporation, No. 723 Research Institute, Yangzhou		
舰船电子对抗		中国船舶工业总公司扬州第723研究所		
Jianchuan Dianzi Duikang		Zhongguo Chuanbo Gongye Zonggongsi Yangzhou Di 723 Yanjiusuo		

Comments/ Specifications:

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Naval and Merchant Ships		China Marine Engineering Academy		
舰船知识		中国造船工程学院		
Jianchuan Zhishi		Zhongguo Zaochuan Gongcheng Xueyuan		

Comments/ Specifications: *For popular consumption.*

Naval Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Radar and		Nanjing Marine Radar Research		
雷达与对抗		南京船舶雷达研究所		
Leida yu Duikang		Nanjing Chuanbo Leida Yanjiusuo		
Comments/ Specifications:				
Army Watercraft	Army Watercraft Institute			
陆军船艇	陆军船艇学院			
Lujun Chuanting	Lujun Chuanting Xueyuan			
Comments/ Specifications:				
Foreign Navies	Naval Armament Demonstration Research Center			
外国海军	海军军备论证研究中心			
Waiguo Haijun	Haijun Junbei Lunzheng Yanjiu Zhongxin			
Comments/ Specifications:				
Contemporary Naval and Merchant Ships		Scientific and Technological Information Research Institute of the China Naval and Merchant Ship		
现代舰船		中国舰船研究所院科技情报研究所		
Xiandai Jianchuan		Zhongguo Jianchuan Yanjiusuoyuan Keji Qingbao Yanjiusuo		
Comments/ Specifications:	*For popular consumption.*			

Naval Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Political Work Review	Naval Political Department	Dalian Naval and Merchant Ships Institute		
政工学刊	海军政治部	海军大连舰船学院		
Zhenggong Xuekan	Haijun Zhengzhi Bu	Haijun Dalian Jianchuan Xueyuan		

Comments/ Specifications:

Air Force Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Land Based Air Defense Weapons **地面防空武器** **Dimian Fangkong Wuqi**	Air Force No. 5 Research Institute 空军第5研究所 Kongjun Di 5 Yanjiusuo		1970	
Comments/ Specifications:	*Many articles on NMD and TMD.*			
Education and Research **教学与研究** **Jiaoxue yu Yanjiu**	PLA Air Force Meteorological Institute 中国解放军空军气象学院 Zhongguo Jiefangjun Kongjun Qixiang Xueyuan			
Comments/ Specifications:				
Journal of Air Force Engineering University **空军工程大学学报** **Kongjun Gongcheng Daxue Xuebao**		Air Force Engineering University 空军工程大学 Kongjun Gongcheng Daxue		
Comments/ Specifications:				
Air Force Logistics **空军后勤研究** **Kongjun Houqin Yanjiu**	Air Force Logistics Department 空军后勤部 Kongjun Houqin Bu	Air Force Logistics Institute 空军后勤学院 Kongjun Houqin Xueyuan		
Comments/ Specifications:				

Air Force Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of the Air Force Radar Academy **空军雷达学院学报** **Kongjun Leida Xueyuan Xuebao**		Air Force Radar Academy 空军雷达学院 Kongjun Leida Xueyuan		
Comments/ Specifications:				
Journal of the Air Force Political Institute **空军政治学院学报** **Kongjun Zhengzhi Xueyuan Xuebao**		(Administered by) Air Force Political Department 空军政治部(管理) Kongjun Zhengzhi Bu (Guanli)		
Comments/ Specifications:				
Radar Troops **雷达兵** **Leida Bing**	Air Force Equipment Department 空军装备部 Kongjun Zhuangbei Bu			Junnei
Comments/ Specifications:				
China's Air Force **中国空军** **Zhongguo Kongjun**	Air Force Political Department 空军政治部 Kongjun Zhengzhi Bu			
Comments/ Specifications:				

Air Force Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Chinese People's Air Defense		National People's Air Defense Office (Beijing)		
中国人民防空		国家人民防空办公室（北京)		
Zhongguo Renmin Fangkong		Guojia Renmin Fangkong Bangongshi (Beijing)		

Comments/ Specifications

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Ordnance Knowledge	China Ordnance Society	China Ordnance Academy	1979	
兵器知识	中国兵工社会	中国兵工学院		
Bingqi Zhishi	Zhongguo Binggong Shehui	Zhongguo Binggong Xueyuan		
Comments/ Specifications:	*For popular consumption.*			
Projectile and Rocket Technology		Armament Industry Projectile and Rocket Specialists Information Network		
弹箭技术		兵器工业弹箭专业情报网		
Danjian Jishu		Bingqi Gongye Danjian Zhuanye Qingbaowang		
Comments/ Specifications:				
Journal of Rocket and Projectile Guidance		National Ordnance Industry		
弹箭与制导学报		国兵工学会		
Danjian yu Zhidao Xuebao		Guobinggong Xuehui		
Comments/ Specifications:				
Journal of the Second Artillery Command Engineering Academy	Second Artillery Command Engineering Academy			Neibu
第二炮兵工程学院学报	第二炮兵工程学院			
Di Er Pao Bing Gongcheng Xueyuan Xuebao	Di Er Pao Bing Gongcheng Xueyuan			
Comments/ Specifications:				

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of Chemical	PLA Chemical Defense Command Engineering Institute		1983	Junnei
防化学报	中国解放军防化指挥工程学院			
Fanghua Xuebao	Zhongguo Jiefangjun Fanghua Zhihui Gongcheng Xueyuan			
Comments/ Specifications:				
Chemical Defense	PLA Chemical Defense Research Institute			Neibu
防化研究	中国解放军防化研究院			
Fanghua Yanjiu	Zhongguo Jiefangjun Fanghua Yanjiuyuan			
Comments/ Specifications:				
National Defense Science and Technology	Strategic Research Center for Defense Science and Technology Development, National Defense Science and	Science and Technology Information Research Office		
Reference Periodical	Technology University			
国防科技参考	国防科技大学国国防科技发展战略研究中心	科技信息研究室		
Guofang Keji Cankao	Guofang Keji Daxue, Guofang Keji Fazhan Zhanlue Yanjiu Zhongxin	Keji Xinxi Yanjiushi		
Comments/ Specifications:	Topics: laser weapons; highpower microwaves; particle beam weapons; antimatter weapons; plasma stealth technology; information warfare; procurement.			

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Ship, Armour, Aircraft, Spacecraft and Weaponry	China Academic Association	Chinese Inertial Technology Institute		
海陆空天惯性世界	中国科协	中国惯性技术学会		
Hai Lu Kong Tian Guanxing Shijie	Zhongguo Kexie	Zhongguo Guanxing Jishu Xuehui		

Comments/ Specifications: _For popular consumption._

Scientific and Technical Logistical Equipment	General Logistics Command			Junnei
后勤科技装备	总后司令部			
Houqin Keji Zhuangbei	Zonghou Siling Bu			

Comments/ Specifications:

Fire Control Radar Technology		Xi'an Electric Engineering Research Institute		
火控雷达技术		西安电子工程研究所		
Huokong Leida Jishu		Xi'an Dianzi Gongcheng Yanjiusuo		

Comments/ Specifications:

Firepower and Command Control		Firepower and Command Control Research Institute		
火力与指挥控制		火力与指挥控制研究会		
Huoli yu Zhihui Kongzhi		Huoli yu Zhihui Kongzhi Yanjiuhui		

Comments/ Specifications:

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of Explosives and Propellants	National Ordnance Industry	Northern China Chemical Industry Company; Central Ordnance Explosive Experts Committee; China Armament Industry No. 204 Research Institute		
火炸药学报	中国兵工学会	中国北方化学工业总公司; 中兵火炸药专业委员会; 中国兵器工业第204研究所		
Huozhayao Xuebao	Zhongguo Binggong Xuehui	Zhongguo Beifan Huaxue Gongye Zonggongsi; Zhongbing Huozhayao Zuanye Weiyuanhui; Zhongguo Bingqi Gongye Di 204 Yanjiusuo		

Comments/ Specifications:

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of the PLA University of Science and Engineering		PLA University of Science and Engineering		
解放军理工大学学报		解放军理工大学		
Jiefangjun Ligong Daxue Xuebao		Jiefangjun Ligong Daxue		

Comments/ Specifications:

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of Preventive Medicine of Chinese People's Liberation Army	PLA Preventive Medicine Center	Academy of Military Medicine Environmental Medicine Research Institute		
解放军预防医学杂志	中国人民解放军预防医学中心	军事医学科学院卫生学环境医学研究所		
Jiefangjun Yufang Yixue Zazhi	Zhongguo Renmin Jiefangjun Yufang Yixue Zhongxin	Junshi Yixue Kexueyuan Weishengxue Huanjing Yixue Yanjiusuo		

Comments/ Specifications:

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Military Command Automation		Military Command Automation Monitoring Office		
军队指挥自动化		军队指挥自动化监视办公室		
Jundui Zhihui Zidonghua		Jundui Zhihui Zidonghua Jianshi Bangongshi		

Comments/ Specifications: *Information Warfare*

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Military Systems Engineering	Academy of Military Science	Military Operations Analysis Research Institute		
军事系统工程	中国解放军军事科学院	军事运筹分析研究所		
Junshi Xitong Gongcheng	Zhongguo Jiefangjun Junshi Kexueyuan	Junshi Yunchou Fenxi Yanjiusuo		

Comments/ Specifications: *C3I and information war;*

Topics: Theory and Method（理论与方法）; Systems Engineering and Management (系统工程与管理); Warfare Research (战法研究)

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Bulletin of the Academy of Military Medical Sciences	Academy of Military Medical Sciences		1956	
军事医学科学院院刊	军事医学科学院			
Junshi Yixue Kexueyuan Yuankan	Junshi Yixue Kexueyuan			

Comments/ Specifications:

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of the Ordnance Engineering College	Ordnance Engineering College			
军械工程学院学报	军械工程院学			
Junxie Gongcheng Xueyuan Xuebao	Junxie Gongcheng Xueyuan			
Comments/ Specifications: *Highly technical*				
Military Oil	General Logistics Department Oil Research Institute (Beijing)			Junnei
军用油料	总后油料研究所(北京)			
Junyong Youliao	Zonghou Youliao Yanjiusuo (Beijing)			
Comments/ Specifications:				
Small Arms	China Military Equipment Group Corporation	China Ordnance Industry No. 208 Research Institute; China Armament Engineering Institute Commission for Small Arms; Small Arms Information Network; China Armament Engineering Institute Small Arms Commission		
轻兵器	中国兵器装备集团公司	中国兵器工业第208研究所; 中国兵工学会轻武器专业委员会; 兵器工业轻兵器专业情报网; 中国兵工学会轻武器学会等主办		
Qing Bingqi	Zhongguo Bingqi Zhuangbei Jituan Gongsi	Zhongguo Bingqi Gongye Di 208 Yanjiusuo; Zhongguo Binggong Xuehui Qingwuqi Zhuanye Weiyuanhui; Bingqi Gongye Qingbingqi Zhuanye Qingbaowang; Zhongguo Binggong Xuehui Qingwuqi		
Comments/ Specifications:				

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
People's Military Surgeon	PLA General Logistics Department, Health Department	General Logistics Department, Health Department, People's Military Surgeon Publishing House		
人民军医	中国人民解放军总后勤部卫生部	总后勤部卫生部人民军医出版社		
Renmin Junyi	Zhongguo Renmin Jiefangjun Zonghouqin Bu Weisheng Bu	Zonghouqin Bu Weisheng Bu Renmin Junyi Chubanshe		
Comments/ Specifications:				
Tanks and Armoured Vehicles	Chinese Ordnance Industry Corporation	Tank Specialist Information Network; Northern China Vehicle Research Institute		
坦克装甲车辆	中国兵器工业集团公司	坦克专业情报网; 中国北方车辆研究所		
Tanke Zhuangjia Cheliang	Zhongguo Bingqi Gongye Jituan Gongsi	Tanke Zhuanye Qinbaowang; Zhongguo Beifang Cheliang Yanjiusuo		
Comments/ Specifications:				
PAP Logistics	China Peoples PAP Logistics Forces Engineering Institute			
武警后勤	中国人民武警后勤部队工程学院			
Wujing Houqin	Zhongguo Renmin Wujing Houqin Budui Gongcheng Xueyuan			
Comments/ Specifications:				
Modern Weaponry		China Weaponry Industry No. 210 Research Institute	1979	
现代兵器		中国兵器工业第210研究所		
Xiandai Bingqi		Zhongguo Bingqi Gongye Di 210 Yanjiusuo		
Comments/ Specifications:	*For popular consumption.*			

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Modern Defense Technology		China Aerospace Corporation, Second Department of Systems Design		
现代防御技术		航空航天部第二总体设计部		
Xiandai Fangyu Jishu		Hangkong Hangtianbu Di'er Zongti Shejibu		
Comments/ Specifications:				
Contemporary Light Weapons		General Armaments Department Light Weapons Research Institute		
现在轻武器		总装备部轻武器论证研究所		
Xianzai Qingwuqi		Zongzhuangbei Bu Qingwuqi Lunzheng Yanjiusuo		
Comments/ Specifications:	*Introduction to light weapon systems*			
Systems Engineering and Electronic Technology		China Aerospace Corporation, Second Research Institute		
系统工程与电子技术		航空航天工业部第二研究院		
Xitong Gongcheng yu Dianzi Jishu		Hangkong Hangtian Gongye Bu Di'er Yanjiuyuan		
Comments/ Specifications:				
Journal of the Institute of Command Technology	National Defense Command Technology Institute		1990	
指挥技术学院学报	国防指挥技术学院			
Zhihui Jishu Xueyuan Xuebao	Guofang Zhihui Jishu Xueyuan			
Comments/ Specifications:	*"Modeling of acquisition and weapons systems expenditures"*			

Military-Technical Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
China's Ordnance Industry		China's Ordnance Industry Corporation		
中国兵工		中国兵器工业总公司		
Zhongguo Binggong		Zhongguo Bingqi Gongye Zonggongsi		
Comments/ Specifications:				
Journal of Chinese Military Communications Technology	PLA Communication Engineering Institute	General Staff Department, No. 63 Research Institute	1980	
中国军事通信技术	中国解放军通信工程学院	中国解放军总参第63研究所		
Zhongguo Junshi Tongxin Jishu	Zhongguo Jiefangjun Tongxin Gongcheng Xueyuan	Zhongguo Jiefangjun Zongcan Di 63 Yanjiusuo		
Comments/ Specifications:				

Provincial and Regional Military Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Border Defense Life		Xinjiang Public Security Border Defense Headquarters		
边防生活		新疆公安边防总部		
Bianfang Shenghuo		Xinjiang Gongan Bianfang Zongbu		
Comments/ Specifications:				
Donghai Region Militia		Political Department of the Nanjing Military Region		
东海民兵		南京军区政治部		
Donghai Minbing		Nanjing Junqu Zhengzhi Bu		
Comments/ Specifications:				
Guangdong Armed Forces	Guangdong Military Region, Political Department			
广东武装	广东军区政治部			
Guangdong Wuzhuang	Guangdong Junqu Zhengzhi Bu			
Comments/ Specifications:				
Guangxi Military Equipment		Guanxi Autonomous Region People's Armed Forces Commission		
广西武装		中华广西壮民自治区委员会人民武装学会		
Guangxi Wuzhuang		Zhonghua Guangxi Zhuangminzizhiqu Weiyuanhui Renmin Wuzhuang Xuehui		
Comments/ Specifications:				

Provincial and Regional Military Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of Hefei Artillery Academy	Hefei Artillery Academy			
合肥炮兵学院学报	合肥炮兵学院			
Hefei Paobing Xueyuan Xuebao	Hefei Paobing Xueyuan			
Comments/ Specifications: _Anhui Province_				
Yellow River People's Militia	Political Department of the Jinnan Military Region			
黄河民兵	济南军区政治部			
Huanghe Minbing	Jinnan Junqu Zhengzhi Bu			
Comments/ Specifications:				
Basic Construction Newsletter	Political Department of the Jinan Military Region			
基层建设通讯	济南军区政治部			
Jiceng Jianshe Tongxun	Jinan Junqu Zhengzhi Bu			
Comments/ Specifications:				
Basic Living		Nanjing Military Region Political Department		
基层生活		南京军区政治部		
Jiceng Shenghuo		Nanjing Junqu Zhengzhi Bu		
Comments/ Specifications:				

Provincial and Regional Military Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Culture in the Barracks **军营文化天地** **Junying Wenhua Tiandi**	PLA Provincial Publishing House 解放军省出版社 Jiefangjun Shengchubanshe			
Comments/ Specifications:				
Science, Technology and National Power **科技与国力** **Keji yu Guoli**	Shaanxi Province Science and Technology Society 陕西省科学技术协会 Shanxisheng Kexue Jishu Xiehui	Shaanxi Province National Defense Committee Youth League 共青团陕西省国防工委 Gongqingtuan Shanxisheng Guofang Gongwei		
Comments/ Specifications:				
Militia Life **民兵生活** **Minbing Shenghuo**	Political Department of the Guangzhou Military Region 广州军区政治部 Guangzhou Junqu Zhengzhi Bu			
Comments/ Specifications:				
National Defense, Shanghai **上海国防** **Shanghai Guofang**	National Defense, Shanghai City 上海市国防 Shanghai Shi Guofang			
Comments/ Specifications:				

Provincial and Regional Military Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of the Xi'an PLA Political Institute	Xi'an PLA Political Institute			
西安政治学院学报	解放军西安政治学院			
Xi'an Zhengzhi Xueyuan Xuebao	Jiefangjun Xi'an Zhengzhi Xueyuan			
Comments/ Specifications:	*Topics: historical; strategic; procurement; political*			
Southwestern People's Militia	PLA Chengdu	Military Region Political Department		
西南民兵	中国解放军成都	军区政治部		
Xinan Minbing	Zhongguo Jiefangjun Chengdu	Junqu Zhengzhi Bu		
Comments/ Specifications:				
National Defense, Yunnan	Yunnan Province Appointed People's Armed Forces Commission			
云南国防	中华云南省委人民武装委员会			
Yunnan Guofang	Zhonghua Yunnan Sheng Weirenmin Wuzhuang Weiyuanhui			
Comments/ Specifications:				
National Defense, Zhejiang	National Defense, Zhejiang Province			
浙江国防	浙江省国防			
Zhejiang Guofang	Zhejiang Sheng Guofang			
Comments/ Specifications:				

PLA Life and Politics

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Journal of National Defense University	National Defense University	National Defense University, Science Research Department		
国防大学学报	**国防大学**	**国防大学科学研究部**		
Guofang Daxue Xuebao	Guofang Daxue	Guofang Daxue Kexue Yanjiu Bu		

Comments/ Specifications: *Topics: study of strategic issues; science of campaigns; study of political work; study of army building; study of teaching and training.*
- Requirements for contributions
- RMA
- Work on "Sanjiang" ("3 Stresses")

Research on Basic Political Work	Political Department of the National Defense Scientific and Technology University	Political Department of the National Defense Scientific and Technology University, Political Research Institute		
基层政治工作研究	**国防科学技术大学政治部**	**国防科学技术大学政治部政治研究院**		
Jiceng Zhengzhi Gongzuo Yanjiu	Guofang Kexue Jishu Daxue Zhengzhi Bu	Guofang Kexue Jishu Daxue Zhengzhi Bu Zhengzhi Yanjiuyuan		

Comments/ Specifications:

PLA Life	PLA General Political Department			
解放军生活	**解放军总政治部**			
Jiefangjun Shenghuo	Jiefangjun Zong Zhengzhi Bu			

Comments/ Specifications:

PLA Life and Politics

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Theoretical Studies on PLA Political Work	Propaganda Section of the PLA Central Political Department	PLA Nanjing Political Institute		
军队政工共理论研究	**中国解放军总政治部宣传部**	**中国解放军南京政治学院**		
Jundui Zhenggong Gonglilun Yanjiu	Zhongguo Jiefangjun Zong Zhengzhi Bu Xuanchuan Bu	Zhongguo Jiefangjun Nanjing Zhengzhi Xueyuan		
Comments/ Specifications:				
Military Ideology Research	China Mao Zedong Military Ideology Institute			
军事思想研究	**中国毛泽东军事思想学会**			
Junshi Sixiang Yanjiu	Zhongguo Mao Zedong Junshi Sixiang Xuehui			
Comments/ Specifications:				
Political Work Herald		PLA Xi'an Political Research Institute		
政工道刊		**解放军西安政治研究院**		
Zhenggong Daokan		Jiefangjun Xian Zhengzhi Yanjiuyuan		
Comments/ Specifications:				
Chinese Military Law	Chinese Military Legal Study Research Committee			
中国军法	**中国法学军法军事法学研究会**			
Zhongguo Junfa	Zhongguo Faxue Junfa Junshi Faxue Yuanjiuhui			
Comments/ Specifications:				

PLA Life and Politics

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Chinese Military Education **中国军事教育** **Zhongguo Junshi Jiaoyu**		Chinese Military Education Institute 中国军事教育学会 Zhongguo Junshi Jiaoyu Xuehui		
Comments/ Specifications:				
China's Militia **中国民兵** **Zhongguo Minbing**	PLA General Political Department 解放军总政治部 Jiefangjun Zongzhengzhi Bu	PLA Newspaper 解放军报 Jiefangjun Bao		
Comments/ Specifications:				
Chinese Decommissioned Military Officers Magazine **中国转业军管杂志** **Zhongguo Zhuanye Junguan Zazhi**				
Comments/ Specifications:				

Defense Economics and Weapons Development Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Weapons Testing	China's Baicheng Weapons Testing Center			
兵器试验	中国白城兵器试验中心			
Bingqi Shiyan	Zhongguo Baicheng Bingqi Shiyan Zhongxin			
Comments/ Specifications:	*Tank testing; Night goggles testing.*			

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Military Finance				
军队财务				
Jundui Caiwu				
Comments/ Specifications:	*No indication of publisher. Author's work units: Military Economic Research Institute（军事经济研究院）; Lanzhou Military Region Logistics Department, Finance Department（兰州军区后勤部 财务部）; Air Force Logistics Institute（空军后勤学院）; Chengdu Military Region Logistics Department（成都军区后勤部）.*			

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Military Economic Research	Military Economic Research Center (Wuhan)	Military Economic Research Institute		
军事经济研究	军事经济研究中心 （武汉）	军事经济研究院		
Junshi Jingji Yanjiu	Junshi Jingji Yanjiu Zhongxin (Wuhan)	Junshi Jingji Yanjiuyuan		
Comments/ Specifications:	*Sections: Macro-Economic Regulations; Military Distribution; Management and Benefits; Logistical Support; Foreign Economy.*			

Defense Economics and Weapons Development Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Military Standardization	General Armaments Department, Electric Information Department	GAD Basic Technology Management Center		
军用标准化	总装备部电子信息基础部	总装备部技术基础管理中心		
Junyong Biaozhunhua	Zongzhuangbei Bu Dianzi Xinxi Jichu	Zongzhuangbei Bu Jishu Jichu Guanli Zhongxin		

Comments/ Specifications: *"Application and Development of Integrated Logistics System"*
"Primitive Analysis of Effectiveness of Quality Management System of Defense Enterprises"
"Thinking About Management of Standardization for Whole Life Cycle of Weaponry"
"Tentative Study of Quality of Weaponry Acquisition"

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Chinese Defense	China National Defense Science and Technology Work Institute	China Institute for Peaceful Use of Military Technology; China Aviation Information Center		
中国军转民	中国国防科学技术工学会	中国和平利用军工技术学会 中国航空信息中心		
Zhongguo Junzhuanmin	Zhongguo Guofang Kexue Jishu Gong Xuehui	Zhongguo Heping Liyong Jungong Jishu Xuehui Zhongguo Hangkong Xinxi Zhongxin		

Comments/ Specifications:

Military History Publications

Publication	Zhu Guan 主管	Zhu Ban 主办	Start Date	Classification
Military History Research	Nanjing Political Institute, Shanghai Branch			
军事历史研究	南京政治学院上海分院			
Junshi Lishi Yanjiu	Nanjing Zhengzhi Xueyuan; Shanghai Fenyuan			
Comments/ Specifications:	*Sections: Research on military thought in new period; PLA History; Modern Military; Ancient Military; Naval History; Foreign Military; Military Ethics*			
Military History	China People's Revolutionary Military Museum			
军事史林	中国人民革命军事博物馆			
Junshi Shilin	Zhongguo Renmin Geming Junshi Bowuguan			
Comments/ Specifications:	*Sections: Military Forum (军事论坛); Weapons Panorama (兵器大观 ）*			

5.   THE MEANING OF MARTIAL LAW FOR THE PLA AND INTERNAL SECURITY IN CHINA AFTER DENG

By Andrew Scobell

In 1989 the State Council of the People's Republic of China (PRC) imposed martial law in two different cities within the space of two months. Martial law was first declared in Lhasa, the riot-torn capital of the Tibetan Autonomous Region in March of that year. Then in May after a month of largely peaceful student protests and a massive outpouring of popular discontent in Beijing, martial law was imposed in sections of the nation's capital.[275] Finally, seven years later martial law legislation was promulgated.

Why did the authorities take the unprecedented steps of imposing martial law in Lhasa and Beijing? Never before in the forty-year history of the PRC had the central government ever declared martial law. Even during the Tibetan revolt of 1959 and in the chaotic years of the Cultural Revolution, martial law was never formally declared in any provincial capital--let alone in the seat of national government.[276] How was martial law imposed in Lhasa and Beijing? How is the term defined? What is the longer term impact of its imposition and subsequent martial law legislation passed by the National People's Congress in March 1996?

The imposition of martial law in Lhasa and Beijing in 1989 has received substantial attention from scholars and analysts outside of China. However this attention has been almost completely limited to considering martial law within the broader contexts of the harsh suppression by the Chinese authorities of the Tibetan nationalist movement and the Chinese pro-democracy demonstrations, respectively.[277] Very little attention has focused on the imposition and enforcement of martial law itself and the involvement of the People's Liberation Army (PLA). Moreover, the martial law legislation of 1996 remains under-examined as does Chinese military law and the body of

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[275] There were reports of martial law also being imposed in the southern cities of Chengdu and Guangzhou, but these turned out to be false. On the reports, see Tokyo Kyodo and Hong Kong *Agence France Presse* [hereafter *AFP*] both 6 June 1989 and both in Foreign Broadcast Information Service, Daily Report: China [hereafter FBIS], 6 June 1998, pp. 45-46, 47.

[276] However, military control (*junshi guanzhi* or *jun guan*) was imposed and military control committees (*junshi guanzhi weiyuanhui*) were formed in March 1959 in locales across Tibet, and in early 1967 in localities throughout China to restore order and assume administrative responsibilities. On the former, see June Teufel Dreyer, *China's Forty Millions: Minority Nationalities and National Integration in the People's Republic of China ,*Cambridge: Harvard University Press, 1976, p.168. On the latter, see Harry Harding, "The Chinese State in Crisis," in the *Cambridge History of Modern China vol. 15: Revolutions within the Chinese Revolution, 1966-82,* New York: Cambridge University Press, 1991, pp. 107-217.

[277] See, for example, on Beijing Yi Mu and Mark V. Thompson*, Crisis at Tiananmen: Reform and Reality in Modern China,* San Francisco: China Books and Periodicals, 1989; *Problems of Communism,* vol. 38, September/October 1989, entire issue.

laws and regulations concerns the PLA that has burgeoned since the 1980s.[278]

This paper is a case study of martial law in post-Mao China. First it examines the origins of martial law, reviews pre-1949 Chinese experiences with this measure, and considers post-Mao Chinese understandings of the concept. Second, the imposition of martial law in Lhasa and Beijing are analyzed. Third, the martial law legislation promulgated in March 1996 is examined and assessed. Lastly conclusions are drawn about what the use and understandings of martial law in post-Mao China reveal about trends in the domestic security role of the PLA.

ORIGINS OF THE TERM MARTIAL LAW

Most regimes around the world allow for "emergency powers" to deal with major crises--although these powers function in a variety of ways with differences in terminology.[279] Few Western legal scholars who would concur on a single, precise meaning of the term.[280] However, most would agree that when a regime invokes emergency powers, it views them as extraordinary measures that grant sweeping powers to the regime beyond the scope of constitutional constraints for a temporary--but often undefined--period of time.[281]

Martial law is a subset of the broader legal term "state of emergency." Legal provisions for states of emergency date back to ancient Rome.[282] The concept has a long history that appears to date back centuries. Originally the term "martial law" was synonymous with "military law" and referred to rules governing the conduct of soldiers during wartime.[283] It was first applied toward civilians during the Wars of the Roses in fifteenth-century England when the crown established special legal tribunals to mete out justice to rebels and their supporters.[284] Over the years martial law has come to be considered an extraordinary measure to deal with emergencies such as war and civil unrest. Under martial law, military authorities take full or partial control over a territory usually when civil authority has collapsed. Civil liberties are usually suspended, regular courts cease to function, and civilians are tried by military courts. *Habeas corpus* is usually suspended, people can be arrested and detained without a warrant, and curfews

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[278] For exceptions, see David S. da Silva Cornell, "The Legal Structure of Martial Law in Beijing," *Chinese Law Reporter*, Vol. VII, Nos. 3-4, 1993, pp. 129-59; Captain David C. Rodearmel, "Military Law in Communist China: Development, Structure, Function," *Military Law Review,* Vol. 119, 1988, pp. 1-98; Thomas A. Bickford, "Regularization and the Chinese People's Liberation Army: An Assessment of Change," *Asian Survey,* Vol. XL, No. 3, May/June 2000, pp. 456-474.

[279] David Bonner, *Emergency Powers in Peacetime,* London: Sweet and Maxwell, 1985, pp. 3-6.

[280] According to one expert: "It is be difficult to be precise about what is meant by the phrase 'emergency powers'." J. C. Garnett, "Emergency Powers in Northern Ireland," in Shao-chuan Leng, ed., *Coping with Crises: How Governments Deal with Emergencies*, Lanham, MD: University Press of America, 1990, p. 47.

[281] Bonner*, Emergency Powers*, pp. 7-8.

[282] Ibid., p. 3.

[283] Charles Fairman, *The Law of Martial Rule*, 2nd ed., Chicago: Callaghan and Co., 1943, pp. 1-6, and 18. According to Fairman, "At the very outset of the study of martial law one is bewildered by the haze of uncertainty which envelops it." Ibid., p. 19.

[284] Ibid., pp. 6-7.

can be imposed.[285]

The Chinese term used for martial law is *jieyan*, which was adopted from Japanese usage. The first character, *jie*, means "warning" or "alert," and the second, *yan*, means "danger" or "crisis." The Japanese had translated it from the French term "state of siege" (*etat de siege*) and some experts insist that the term *jieyan* as it is used by the Chinese Nationalists or Kuomintang is more accurately translated into English as "state of siege."[286] Certainly this has some merit given its French origins, however, because the term *jieyan* is virtually always translated into English as "martial law" and because of the general ambiguity often surrounding these terms, martial law is the preferred translation in this paper.[287]

NON-COMMUNIST CHINA EXPERIENCE WITH MARTIAL LAW

The history of martial law in China dates back to the final years of the Qing dynasty. The outline of a 1908 draft constitution--modeled on Japan's Meiji Constitution--included provisions for martial law.[288] Article 36 of the Provisional Constitution of the ROC promulgated in March 1911 authorized the president to declare martial law in times of emergency. This constitutional power was given structure by a 'martial law' law (*jieyan fa*) issued nine months later.[289] Martial law was also mentioned in Article 71 of the so-called "Temple of Heaven" draft constitution of 1913.[290] The Nationalist government in Canton also issued a set of martial law regulations in 1926. Then, in 1934, a new revised *jieyan fa* was promulgated by the Nationalist government.[291]

The ROC constitution of 1947 provides for the imposition of martial law. Article 39 stipulates that the president of the republic can declare martial law.[292] According to Article 43, the president may issue emergency decrees in accordance with the "Law on Emergency Orders." But this law was never enacted and the actual legal basis for the martial law in effect between 1948 and 1987 was the "Temporary Provisions Effective During the Period of Communist Rebellion" adopted by the ROC National Assembly in April 1948. In December 1948, in the face of mounting Nationalist defeats, Chiang Kai-shek announced the imposition of martial law throughout the country.[293]

Thus until 1989, invocation of martial law in the Chinese context was limited to the

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[285] See, for example, Ibid., pp. 42, 45; *Black's Law Dictionary*, 5th ed., St. Paul, MN: West Publishing Company, 1979, pp. 878-79.

[286] Tao-tai Hsia with Wendy Zeldin, "Laws on Emergency Powers in Taiwan," in Leng, ed., *Coping with Crises*, pp. 180-81.

[287] According to Fairman, under a state of siege the "powers of the military are somewhat precisely defined in advance, [while] martial rule [or law] is provisional in character. The former is more certain, the latter is more flexible." *The Law of Martial Rule*, p. 47.

[288] Hsia and Zeldin, "Laws on Emergency Powers in Taiwan," p. 175.

[289] Ibid., p. 181.

[290] Ibid., p. 176.

[291] This law was amended in 1948 and 1949. See Hsia and Zeldin, "Laws on Emergency Powers in Taiwan," pp. 181-82.

[292] Ibid., p. 182.

[293] Ibid., pp. 177-79. A new *Jieyan Fa* was promulgated in May 1948. This declaration, however, did not include Taiwan, which did not formally fall under martial law until May 20, 1949 following a declaration to this effect by the Taiwan Garrison Headquarters the previous day. Ibid., p. 182.

ROC regime in Taiwan which imposed martial law for almost four decades. This probably qualifies, as one mainland broadcast to Taiwan claimed, as the "longest imposition of martial law" by a regime anywhere in the world.[294] Martial law was finally lifted on Taiwan by the late president Chiang Ching-kuo in July 1987. Under martial law in the ROC, the Taiwan Garrison Command had sweeping powers, including the right to supercede any civil law or regulation and to screen publications prior to distribution.[295] Civilians were tried in military courts, although the jurisdiction of these courts and the number of persons subject to military trials declined significantly over the course of martial law.[296] The use of military courts to try civilians remained essentially limited to crimes of sedition.[297]

Martial Law in PRC History

The 1954 state constitution of the PRC made allowance for martial law (*jieyan*). There are only two specific references to it in the document. Article 40 vested the right to declare the imposition of martial law to the chairman of the PRC and Article 31 granted the Standing Committee of the National People's Congress (NPC) with the power to "decide on enforcement of martial law throughout the country or in certain areas." Prior to 1989 constitutional provisions were never formally invoked or tested.[298] The closest occasion in the Deng Xiaoping era came in December 1986 when student protests swept Chinese cities. At a December 25 meeting of the Central Military Commission (CMC), some members reportedly urged that martial law be imposed. Speaking five days later, Deng Xiaoping said that the regime should not shy away from using "dictatorial means" such as martial law to deal with the protests.[299]

During the Mao Zedong era there are occasions where martial law was merited but not officially imposed. The first was in the aftermath of the Tibetan uprising in mid-March 1959, when the Tibetan Local Government was dissolved and the Preparatory Committee for the Tibetan Autonomous Region assumed the responsibility of governing the region. A State Council order dated March 28 and signed by Premier Zhou Enlai formalized this move and instructed the Tibetan Military Area Command to completely

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[294] See "Mainland, Taiwan Martial Law Differences Noted," Beijing radio broadcast to Taiwan, 25 August 1989, translated in FBIS, 6 September 1989, p. 52.

[295] Ibid., pp. 50-51.

[296] John F. Copper, "Ending Martial Law in Taiwan: Implications and Prospects," *Journal of Northeast Asian Studies*, Vol. VII, No. 2, Summer 1988, pp. 5-8.

[297] The most important case was the 1980 trial of a group of opposition activists on charges stemming from a 10 December 1979, melee between demonstrators commemorating International Human Rights Day and riot police in the southern city of Kaohsiung. Of the one hundred or so people arrested by the authorities forty-one were charged. Of these, thirty-three had their cases heard in civilian courts, but the remaining eight were charged with sedition and tried by a military court. On the case, see John Kaplan, *The Court-Martial of the Kaohsiung Defendants*, Research Papers and Policy Papers No. 2, Berkeley: Institute of East Asian Studies, University of California, 1981.

[298] See, for example, the discussion in Liu Xiaobing, "Jieyanfa de lilun sikao, [Theoretical consideration on martial law]," *Zhongguo faxue* [Chinese Jurisprudence], No. 34, 9 March 1990, p. 60.

[299] See "Party Documents on Anti-Bourgeois Liberalization and Hu Yaobang's Resignation, 1987," in James Tong, ed., *Chinese Law and Government* 21:1, Spring 1988, pp. 6, 20.

crush the rebellion.[300] Although not explicit from the March 28 order, the PLA was ordered to assume military control in cities and towns in the region.[301] Then, at the height of the Cultural Revolution when Mao and other Chinese leaders feared that China might lapse into total chaos or civil war the country was placed under de-facto martial law. In January 1967, the central authorities issued orders directing the PLA to intervene in the Cultural Revolution.[302] The army was instructed to take over responsibility for law and order, effectively placing China under nation-wide military rule. The term used on both occasions was not *jieyan*, but *junshi guanzhi* (or *jun guan*) meaning military control.[303]

Martial law was not mentioned in either the 1975 or the 1978 PRC constitutions. Chinese legal scholars writing about martial law give no reason for this omission,[304] but there are probably two main reasons. First, the 1975 and the 1978 constitutions are abbreviated documents: both are substantially shorter than the 1954 version and much is omitted.[305] Second, there is no mention of martial law because of the Lin Biao affair. While full details of the affair still remain shrouded in mystery, it appears that the son of Defense Minister Lin Biao launched an aborted military coup against Mao in 1971.[306] The 1975 and 1978 documents both emphasize that the PLA is under strict CCP control. Any mention of martial law might have provided a constitutional basis for a military takeover and highlighted the possibility of a military challenge to the supremacy of the party.

THE LEGAL STATUS OF MARTIAL LAW IN THE DENG ERA

Under the leadership of Deng Xiaoping, China has placed a renewed emphasis on "socialist legality," and there has been an unprecedented stream of laws and regulations

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[300] "Order of the State Council of the Chinese People's Republic," cited in U.S. Consulate General, Hong Kong, *Current Background* [hereafter USCB], no. 553, 1 April 1959, p. 1.

[301] "Communique on the Revolt in Tibet by New China News Agency," cited in USCB no. 553, 1 April 1959, p. 5.

[302] "Decision of the CCP Central Committee, the State Council, the Military Commission of the Central Committee, and the Cultural Revolution Group under the Central Committee on Resolute Support for the Revolutionary Masses of the Left," 23 January 1967, cited in USCB, no. 852, 6 May 1968, pp. 49-50.

[303] Harding, "The Chinese State in Crisis," p. 165. The intervention by the PLA in the Cultural Revolution was a complex, confusing, and protracted process involving advances and setbacks and required many months for the military to re-establish order throughout the country. For more on the PLA in the Cultural Revolution, see Li Ke and Chi Shengzhang, "*Wenhua Dageming" zhong de Renmin Jiefangjun* [The People's Liberation Army During the "Great Cultural Revolution"], Beijing: Zhonggongdang liziliao chubanshe, 1989; and Andrew Scobell, "Explaining China's Use of Force" (unpublished book manuscript), chap 5.

[304] See, for example, Liu Xiaobing, "Jieyanfa de lilun sikao," p. 60.

[305] The 1975 constitution has 30 articles and is 4,000 words long while the 1954 version had 106 articles and contained 14,000 words. For analysis, see John Gardner, "The Chinese Constitution of 1975," *Government and Opposition*, Vol. 11, No. 2, Spring 1976, pp. 212-23.

[306] Andrew Scobell, "Military Coups in the People's Republic of China: Failure, Fabrication, or Fancy?" Journal of Northeast Asian Studies, Vol. XIV, No. 1, Spring 1995, pp. 32-35; and Jin Qiu, *The Culture of Power: The Lin Biao Incident and the Cultural Revolution*, Stanford: Stanford University Press, 1999.

by the central government covering virtually all spheres of human endeavor. The 1982 state constitution in many respects exemplifies this massive codification effort and contains a record number of 138 articles, including three new references to martial law. Article 67 empowers the Standing Committee of the NPC to decide on the enforcement of martial law in entire provinces, autonomous regions, or municipalities directly under the central government (i.e. Beijing, Tianjin, Shanghai, or Chongqing). According to Article 89, however, the State Council has the authority to declare martial law in parts of these jurisdictions. Thus, as one Chinese legal scholar notes, "in contrast to the 1954 constitution, the decision-making power (*jueding quan*) on implementing martial law is divided between the Standing Committee of the NPC and the State Council."[307] Article 80 of the 1982 constitution invests the office of the State President with the task of formally proclaiming martial law.

PRC DEFINITIONS AND RATIONALES

According to a Chinese law dictionary published in 1986, martial law is defined as a "special measure" that a state can take "in the event of war or other extraordinary situations." It continues:

> [f]ollowing the imposition of the martial law order, the guarding of vital lines of communications and important locations is increased, patrols are strengthened, searches organized, and the movement of motor vehicles, boats, and aircraft is controlled. The activities of the masses are restricted and curfews are imposed in order to ensure public security, social order and safeguard state security. Martial law violators are punished according to the law.[308]

A legal affairs expert in the Ministry of Public Security, Hao Chiyong, writing in March 1989 just after the imposition of martial law in Lhasa, defined martial law in similar terms:

> ...a special measure imposed on the whole or part of a country in time of war or under emergency circumstances to protect state security and the personal safety and property of the citizens. Martial law generally includes military control during which military command and management is exercised in government and civilian organs in the area where martial law is imposed, or military personnel exercise administrative powers on behalf of these government and civilian organs. In most cases guards are posted on patrol duty; searches are conducted; traffic is closed to planes, automobiles and ships; parades, demonstrations, petitions and strikes are prohibited; and a curfew is imposed. Violations of martial law are subject

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[307] Liu Xiaobing, "Jieyanfa de lilun sikao," p. 60.

[308] Zhao Guochao, Zhuang Zheng, Xu Furong and Kuang Yaozhong, eds., *Faxue cidian* [Dictionary of legal studies], 2nd printing, Shanghai: Cishu chubanshe, 1986, p. 481.

to legal sanctions more severe than in ordinary times.[309]

According to an in-depth September 1989 article in *Liberation Army Daily:*

...martial law means the emergency measures carried out by the armed forces of a country when the security of that country or parts of that country is threatened from a macro viewpoint by factors such as war, turmoil, or natural disaster.[310] Liu Xiaobing explains:

In a broad sense 'martial law' law (*jieyan fa*) is the general name for laws and regulations relating to martial law (*jieyan*). This includes the following elements: the constitution, 'martial law' law (*jieyanfa*), martial law decisions (*jieyan jueding*), martial law decrees (*jieyan ling*), all kinds of notices (*tonggao*), and orders (*mingling*) issued during the period martial law is in effect. In a narrow sense...'martial law' law (*jieyan fa*) is the indication that because of war or another extreme situation, martial law has been imposed upon an entire country or part thereof on the basis of a special law.[311]

The martial law legislation of March 1996 conforms quite closely to the descriptions outlined above.[312] These Chinese definitions of martial law also conform closely to those of Western and Soviet legal scholars.[313]

Chinese interpretations, however, note one major difference between Western, Soviet and Chinese definitions of martial law; that is, in China the term refers simply to a

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[309] Hao Chiyong, "Martial Law--An Indispensable Emergency Measure in Modern State Administration," *Renmin gongan bao* [People's Public Security Daily], 24 March 1989, translated in FBIS, 3 April 1989, p. 37.

[310] Xu Jiangrui, "Tentative Discussion on the Theory of Martial Law," in *Jiefangjun bao* [Liberation Army Daily] [hereafter JFJB], 7 September 1989, translated in FBIS, 28 September 1989, p. 40.

[311] Liu Xiaobing, "Jieyanfa de lilun sikao," p. 61.

[312] *Zhonghua Renmin Gongheguo Jieyan Fa* [Martial law Law of the People's Republic of China], Beijing: Falu chubanshe, March 1996.

[313] According to the 1970 edition of the *Great Soviet Encyclopedia*, martial law is: "a special condition in a country or particular parts of a country, usually established by the decision of the highest body of state power under exceptional circumstances (war, natural disasters, revolutionary actions by the masses in capitalist countries, and so on).... Under martial law all functions of bodies of state power in questions of defense, public order, and state security pass to the military bodies...." *Great Soviet Encyclopedia* vol. 5, translated from the 3rd Russian edition of 1970, New York: Macmillan, Inc., 1974, p. 250. For a more recent discussion of martial law, see "State of Emergency: Lawyers Discuss What Sort of Law We Need for Extreme Situations," *Moscow News Weekly* (in English), 2-9 July 1989, p. 10. *Black's Law Dictionary* states that martial law is: "[w]hen military authorities carry on government or exercise various degrees of control over civilians or civilian authorities in domestic territory....Such may exist either in time of war or when civil authority has ceased to function or has become ineffective." *Black's Law Dictionary*, p. 878.

general condition rather than different types or variations of martial law.[314] Chinese legal scholars comment that in the United States there are two main types corresponding to the different levels of government that employ martial law: state level (*zhou ji*) and federal level (*lianbang ji*). In the Soviet Union, according to Chinese scholars, there are three distinct types of martial law which correspond to the degree of severity of the situation. At one extreme there is full military control (*junshi guanzhi),* followed by martial law (*jieyan*) as the Chinese understand the term; and third there is curfew (*xiaojin*). China, however, makes no such distinction; there is no "typology/hierarchy" (*cengci*) of martial law types.[315] Experts say that as the state of the exception martial law should be used sparingly. Perhaps Chinese scholars' harshest criticism on the use of this measure in the United States is that it had been "excessively" employed.[316]

Nevertheless, Chinese scholars do distinguish between two broad types of martial law. In the first type "administrative and judicial authority is altered,"[317] and the military takes over all functions of government:

> [A]ll the powers of national defense, maintaining social order, and state security [are transferred] to the supreme commander of the martial law troops....Under such circumstances, the martial law troops issue orders independently.[318]

In the second type, military and civilian authorities coordinate their functions in some fashion, but "administrative and judicial authority is not altered."[319] In one variation of this second type, "troops exercise functions jointly with the government."[320] In a second variation of this second type, civilian authorities continue to rule "with the assistance of martial law troops. Under such circumstances, the government generally issues circulars independently."[321] According to one scholar at the Academy of Military Sciences: "[v]iewed from the practice of martial law imposed in Beijing,...the functions of martial law troops belonged to the second [variation]...."[322]

Indeed, virtually all official pronouncements and writings by Chinese legal scholars stress that martial law as it was imposed in Lhasa and Beijing in 1989 was very different from the first type. Every effort was made to show that the party and state administration is still in place and still functioning. Thus according to Hao Chiyong: "...martial law in Lhasa does not include enforcement of military control and matters

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[314] This assertion appears to stem from the fact that Chinese legal scholars view martial law as a blanket term that includes other abnormal conditions such as a "state of emergency" (*jinjing zhuangtai*). Liu Xiaobing, "Jieyanfa de lilun sikao," pp. 60-61.

[315] Ibid.

[316] Ibid., p. 63. Liu remarks on the use of martial law by state governors in the Great Depression.

[317] Ibid., p. 65.

[318] Xu Jiangrui, "The Legal Status of Martial Law Troops," *Jiefangun bao*, 17 August 1989, translated in FBIS, 12 September 1989, p. 15; and in Liu Xiaobing, "Jieyanfa de lilun sikao," p. 65.

[319] Ibid., p. 66.

[320] Xu Jiangrui, "The Legal Status of Martial Law Troops," p. 15.

[321] Ibid.

[322] Ibid.

concerning martial law are decided by the regional government."[323] And in Beijing martial law enforcement troops were obeying orders from the State Council and Beijing Municipal government and "assisting" law enforcement personnel to restore order.[324] The PRC regime certainly did not become a military government: no army coup d'etat occurred in April, May or June 1989.[325] There is almost certainly concern that parallels will be drawn with the restoration of control during the Cultural Revolution by the PLA. In short, the effort is to disassociate *jieyan* from *junguan*.

Rationales
  In analyses of martial law, authoritative Chinese accounts discuss its use, not just within the framework of socialist systems, but within the framework of political systems around the world. They argue that governments of all political persuasions around the world use it, and China. Hao Chiyong argues:

> As a matter of fact, no government has ever given up this emergency
> measure [martial law] in the course of maintaining social stability and
> exercising effective state administration.[326]

  The same basic rationale is given by different writers: "Martial law is an indispensable emergency measure in modern state administration."[327] As Qiao Shaoyang, the Vice Chair of the NPC Standing Committee's Legal System Working Committee, told his colleagues when the draft law was introduced: "States in the world that are working to perfect their legal systems all have this kind of legal institution to deal with emergency situations."[328]
  According to Qiao, in the process of drafting on the *Jieyan Fa* the examples of foreign countries were examined along with relevant foreign legal regulations.[329] Surprisingly, much of the discussion of states of emergency and martial law overseas dwells on Western countries, notably the United States, France, the Federal Republic of Germany, and to a lesser extent the United Kingdom. Certain scholars also focus on the experiences of Turkey, Japan, and India.[330] The writers take pains to stress, however, that the rationale of martial law in a workers' and peasants' state is very different from

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[323] Hao Chiyong, "Martial Law--An Indispensable Emergency Measure," p. 38.

[324] *Jiefangun bao,* 4 June 1989, translated in FBIS, 5 June 1989, at 77-78.

[325] At least one observer has argued that the events might constitute a military coup. See John Fincher, "Zhao's Fall, China's Loss," in Foreign Policy, No. 76, Fall 1989, p. 14. Most scholars, however, do not see it this way. Scobell, "Military Coups in the People's Republic of China," pp. 31-32.

[326] Hao Chiyong, "Martial Law--An Indispensable Emergency Measure," p. 38.

[327] Ibid., p. 37; Xu Jiangrui, "The Legal Status of Martial Law Troops," p. 17.

[328] Qiao Shaoyang, "*Guanyu Zhonghua Renmin Gongheguo Jieyan Fa (canan) de shuoming*" [An Explanation of the PRC's Martial Law (draft)] in *Zhonghua Renmin Gongheguo Jieyan Fa*, p. 13.

[329] Ibid., p. 14.

[330] For mention of Great Britain, see Liu Xiaobing, "Jieyanfa de lilun sikao"; Xu Jiangrui, "The Legal Status of Martial Law Troops,"; on Japan, see Yang Haikun, "Lun xingzheng jingji quanli" [On administrative power of emergency], *Zhongguo Faxue* [Chinese Jurisprudence], No. 1, 9 January 1990, pp. 28-36. All three writers examine the U.S., France and the FRG.

that of a capitalist one. In the former, the regime invokes the measure to protect the people, while in the latter martial law is used to oppress the workers and crush strikes and protests. One legal scholar cites the use of martial law by state governors in the United States during the Great Depression to deal with economic emergencies such as labor disputes by oil workers.[331]

Interestingly, little mention is made of martial law regulations and emergency powers in other communist states. The communist state most often cited is the Soviet Union, although passing mention is also made of Yugoslavia, Czechoslovakia, Hungary, the German Democratic Republic and Romania.[332]

According to Chinese analyses there are several types of crisis situations that might merit martial law. These include internal disturbances, war or invasion, economic crises, and natural disasters.[333] According to one mainland scholar, martial law ought not to be used in the event of economic emergencies or natural disasters except in severe cases. His rationale for this is that effects of using martial law by foreign governments in such cases has "not been very good" (*bing bushi hen hao*). Such situations, he suggests, arise not infrequently and tend to result in excessive use of martial law.[334]

According to Article Two of the 1996 *Jieyan Fa*, "In a state of emergency during which serious turmoil, riots or disturbances occur that endangers national unity, security or public security; whereup emergency measures can help preserve social order, and protect the lives and property of the people, the state can decide to impose martial law."

The official reason for the imposition of martial law in Lhasa was the continuing disturbances by "a small number of separatists" (*shaoshu fenliezhuyifenzi*).[335] These incidents reportedly resulted in 16 deaths (including at least one policeman), 120 injured persons, substantial property damage and "severely disrupted social stability" in the city.[336] The rationale for the declaration of martial law in Beijing was to suppress "serious turmoil" (*yanzhong de dongluan*) that had "destroyed social stability and disrupted normal life and social order."[337]

MECHANICS AND LOGISTICS

In both Lhasa and Beijing the pattern of implementation was essentially the same. In the former case the State Council officially made the decision to impose martial law in

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[331] Liu Xiaobing, "Jieyanfa de lilun sikao," p. 63.

[332] For mention of Yugoslavia, Czechoslovakia and Hungary, see Yang Haikun, "Lun xingzheng jingji quanli." On Romania and the GDR, see Liu Xiaobing, "Jieyanfa de lilun sikao." Yang, Liu and Xu Jiangrui, "Tentative Discussion on the Theory of Martial Law," all discuss the Soviet Union.

[333] Ibid., p. 40; and Yang Haikun, "Lun xingzheng jingji quanli," p. 34.

[334] Liu Xiaobing, "Jieyanfa de lilun sikao," pp. 62-63.

[335] "*Guowuyuan guanyu zai Xizang Zizhiqu Lasashi shixing jieyan de mingling*" [State Council order imposing martial law in Lhasa city in the Tibetan Autonomous Region], in *Zhonghua Renmin Gongheguo Guowuyuan Gongbao* [PRC State Council Bulletin] [hereinafter GWYGB], No. 3, 16 March 1989, p. 113.

[336] Sang Ga and Hua Zi, "Tasks of Martial Law in Lhasa Triumphantly Fulfilled," *Liaowang* [Wide Angle], 21 May 1990, translated in FBIS, 25 May 1989, pp. 47-48.

[337] "*Guowuyuan guanyu zai Beijingshi bufen diqu shixing jieyan de mingling*" [State Council order declaring martial law in parts of Beijing city], in GWYGB, No. 9, 25 June 1989, p. 392.

Lhasa effective midnight on March 7. The order was formally signed by Premier Li Peng, and it authorized the government of the Tibetan Autonomous Region to enforce martial law by whatever means necessary.[338] The State Council also ordered the imposition of martial law in Beijing two months later. Li Peng made the public announcement on state television on the night of May 19 and affixed his name to the official document. The order--almost a carbon copy of the Lhasa order--authorized the Beijing municipal government to take whatever measures it felt necessary to restore order. President Yang Shangkun spoke immediately after the premier on the live broadcast, stating that units of the People's Liberation Army were being ordered to move into the capital to restore order. However, the actual Beijing decision--and almost certainly the Lhasa decision too--was made by Deng Xiaoping and other octogenarians who had ostensibly retired or stepped into purely advisory positions. Deng, although he then held no formal office except Chairman of the State and Party CMC, remained China's paramount leader with unparalleled authority and influence.[339]

During the periods when Lhasa and Beijing were under martial law, regulations on how this measure should be imposed, managed, and lifted had not been officially promulgated. Although civilian authorities and military units had no official *jieyan fa* to follow, from late 1989 on they were able to consult an internally circulated draft law. A draft law was not made public, however, until one was introduced to the Standing Committee of the NPC in December 1995.[340]

Allegations have been made that the imposition of martial law at least in the case of Beijing was illegal or improper, and these charges will be examined below. Nevertheless, arbitrariness and lack of structure in the application of martial law is not unique to the PRC. The administration of martial law in the British empire, for example, reportedly evolved gradually from a "clumsy beginning" into "an efficient system guided by a rather elaborate code."[341] At least one PLA law cadre has admitted that authorities learned by trial and error from the experience of administering martial law in Lhasa and Beijing.[342]

The order signed by Premier Li Peng declared martial law in unspecified "parts"

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[338] See "*Guowuyuan guanyu zai Xizang Zizhiqu Lasashi.*"

[339] On who made the decision to impose martial law, see Andrew Scobell, "Why the People's Army Fired on the People," in Roger V. Des Forges, et al., eds., *Chinese Democracy and the Crisis of 1989: Chinese and American Reflections*, Albany: State University of New York Press, 1993, p. 196; and Zhang Liang (pseud.) complier, and Andrew J. Nathan and Perry Link, eds., *The Tiananmen Papers,* New York: Public Affairs, 2001.

[340] A 'martial law' law was not made public until December 20, 1995, when a draft was submitted to the NPC Standing Committee for approval. According to the official Xinhua News Agency, the draft had undergone many revisions since its initial formulation in late 1989. Comprising more than two dozen articles, the draft adheres very closely to the conceptions of martial law articulated by the Chinese officials and legal scholars, which are cited here. See *Xinhua,* 20 December 1995 translated in FBIS, 21 December 1995, p. 22. On assertions by Chinese jurists that martial law regulations did not exist, see Liu Xiaobing, "Jieyanfa de lilun sikao," p. 60; and Xu Jiangrui, "Tentative Discussion on the Theory of Martial Law," p. 39. On suspicion that martial law regulations had been formulated secretly, see da Silva Cornell, "The Legal Structure of Martial Law in Beijing," pp. 132-33.

[341] Fairman, *The Law of Martial Rule*, p. 53.

[342] Xu Jiangrui, "Tentative Discussion on the Theory of Martial Law," pp. 39-40.

(*bufen diqu*) of Beijing.³⁴³ Mayor Chen Xitong revealed the specific areas under martial law in Martial Law Order Number One, dated the same day.³⁴⁴ Those affected comprised all four urban districts (Dongcheng, Xicheng, Xuanwu and Chongwen), and four of the six suburban districts (Shijingshan, Haidian, Fengtai and Chaoyang). All nine rural counties were exempted.

However, the areas of the municipality that were set under martial law comprise for all intents and purposes the whole region. A leading scholar of Chinese law contends that the decision complied "with the letter of constitution but not with its spirit."³⁴⁵ To abide by the intent of the constitution, the entire municipality should have been placed under martial law. For this to have been done, of course, the NPC Standing Committee would have had to approve it. Had the Standing Committee been called into session there is no guarantee the body would have voted for martial law. Indeed, there is good reason to believe that the Committee would have refused to rubber stamp the decision of Deng and the other octogenarians. This is probably the main reason why the Standing Committee was not called into special session.³⁴⁶

The right of the State Council to declare martial law has been staunchly defended by Chinese legal experts. According to Liu Xiaobing of the Jiangsu Provincial Party School:

> Practice has proved that it was because the State Council has the power to declare martial law in parts of provinces, autonomous regions, and municipalities directly administered by the central government, that the response was timely, forceful and definitely capable of containing the outbreak of an extreme situation."³⁴⁷

The late Peng Zhen, a CCP elder and legal expert, also defended the imposition of martial law as proper and completely legal. He noted that the State Council clearly had the constitutional power to implement martial law in parts of a municipality directly administered by the central government. According to Peng the total portion affected constituted only about one-seventeenth of the entire Beijing municipal area of 16,800 square kilometers.³⁴⁸

While Li Peng signed the official decree on behalf of the State Council, there is no indication that either the entire State Council or its executive committee ever met to vote on the martial law decision. Again, the reason no such vote was ever held was probably because the outcome would have been in doubt.³⁴⁹ Shanghai wall posters put up in May

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³⁴³ "*Guowuyuan guanyu zai Beijing.*"

³⁴⁴ "*Beijingshi Renmin zhengfu ling (diyihao)*" [Beijing Municipal People's Government order no. 1], in GWYGB, No. 9, 25 June 1989, pp. 392-93.

³⁴⁵ Jerome Alan Cohen, "Law and leadership in China," *Far Eastern Economic Review* [hereafter FEER], 13 July 1989, p. 23.

³⁴⁶ Ibid.

³⁴⁷ Liu Xiaobing, "Jieyanfa de lilun sikao," p. 64. Liu claims this was the reason that provision was made in the 1982 constitution to grant this authority to the State Council. Ibid.

³⁴⁸ *Renmin ribao* [People's daily] [hereafter *RMRB*], 30 May 1989, translated in FBIS, 30 May 1989, p. 25.

³⁴⁹ Cohen, "Law and Leadership in China," p. 23.

1989 questioned whether the premier had the authority to issue a decree on behalf of the entire State Council.[350] The decision to impose martial law in Lhasa, in contrast, appears to have reflected unanimity within the Chinese leadership--both among the "retired" octogenarians and younger formal office holders--that the situation in Tibet was serious enough to merit the measure.[351] In addition, while the constitution is specific on what organ or office has the power to invoke martial law, the means by which the body is to arrive at this decision "has not been defined clearly."[352]

The process has also been criticized on the grounds that the NPC Standing Committee was prevented from promptly meeting to review the State Council's martial law decision.[353] Under Article 67 of the 1982 State Constitution, the Standing Committee has the power to "annul those administrative rules and regulations, decisions or orders of the State Council that contravene the Constitution or the statutes." Speaking in late May 1989, Peng Zhen insisted that the State Council's martial law order was "fully in accord with the Constitution and the law. The order does not contravene the Constitution or statutes on the slightest degree." This being the case he concluded, how could "the NPC Standing Committee not support it?"[354]

Efforts were made by Yan Jiaqi, Bao Zunxin and others to call a special session of the NPC Standing Committee to consider formally rescinding the State Council's martial law decree. They circulated a petition and sent telegrams to Standing Committee members urging them to meet in emergency session. This drive only succeeded in getting the key instigators including Yan and Bao branded as subversives and criminals, although those involved in the effort continue to insist that the move was completely legal.[355] At a minimum the State Council is required by Article 92 to submit reports on its activities to the NPC, or the NPC Standing Committee if the full NPC is not in session. However, the Standing Committee did not meet until late June when it heard a long official speech on martial law and the suppression of the "counter-revolutionary rebellion" delivered by Mayor Chen Xitong on behalf of the State Council a month later. In contrast, Premier Li Peng reported on the imposition of martial law in Lhasa on March 20 to the NPC as part of his government work report--two weeks after he formally issued

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[350] Cited in Timothy A. Gelatt, "Law Reform in the PRC After June 4," *Journal of Chinese Law,* Vol. 3, No. 2, Fall 1989, p. 323.

[351] Robert Delfs, "Repression Repeated: Riots and Martial Law Scuttle Peace Hopes for Tibet," *Far Eastern Economic Review*, 19 March 1989, p. 10. However, it is also not at all clear how the decision was made.

[352] Xu Jiangrui, "Tentative Discussion on the Theory of Martial Law," pp. 40-41.

[353] Cohen, "Law and Leadership in China," p. 23.

[354] *Renmin ribao,* 30 May 1989, translated in FBIS, 30 May 1989, p. 25.

[355] See, for example, "Beijing Mayor's Address to NPC Standing Committee on Background to June 4th Massacre," in "Quarterly Chronicle and Documentation," *China Quarterly*, No. 120, December 1989, pp. 938-39. On protestations that the drive to call the Standing Committee in to emergency session was legal, see the summation of Standing Committee Member Hu Jiwei's defense of his actions in ibid., pp. 894-95; and student leader Wang Dan's defense at his trial detailed in K. Holden, "The Other Side of the Story of Wang Trial," *Asian Wall Street Journal* , 11 March 1991, p. 12. On the drive itself, see Shikai Hu, "Representation Without Democratization: The 'Signature Incident' and China's National People's Congress," *Journal of Contemporary China*, Vol. 2, No. 1, 1993, pp. 3-34. On the impact of the incident on the NPC, see Murray Scot Tanner, *The Politics of Lawmaking in Post-Mao China: Institutions, Processes and Democratic Prospects*, Oxford: Clarendon Press, 1999, p. 238.

the order.[356]

MARTIAL LAW IN BEIJING, 1989

In analyzing the experience of martial law in the Chinese capital, three distinct phases can be discerned. First, there was the period of "phony martial law" which was formally in effect for two weeks but not enforced. Second, came the "enforcement" period, in which the army moved forcefully to implement martial orders, that continued for about a week. This was followed by the "maintenance" period--the third and longest-- in which life in the capital largely returned to a semblance of normalcy and authorities prepared to lift martial law. In all three periods it was the PLA and not the PAP or the People's Police that was the key institution.

Phony Martial Law

The period of "phony martial law" lasted from May 20 until June 2. Even before martial law formally went into effect in the parts of Beijing at 10 am on May 20, detachments of the PLA tried to enter the city center. Despite this head start, thanks to the dramatic acts of defiance by city residents who poured onto the streets of the capital, soldiers were unable to enforce martial law.[357] Thus, the three orders issued by Mayor Chen Xitong dated May 20 were unenforced. The first order was addressed specifically to Chinese, the second to foreigners, and the third was aimed at members of the press. The first order banned the spreading of rumors, speechmaking, or handing out leaflets, trespassing on state property, destroying or damaging property and forbade disturbing foreign embassies. The second order warned foreigners to comply with all martial law instructions and not to get involved in the protests.[358] The third order issued by Chen Xitong banned journalists from "instigative or demagogic reporting," and forbade foreign reporters from conducting their work without the prior approval of the municipal government.[359] Orders one and two warned that troops would adopt "any means" (*yiqie shouduan*) to deal with violators. The following day the Martial Law Troop Enforcement Command (*Jieyan budui zhihuibu*) (hereinafter MLEC) issued its first notice to the people of Beijing. The notice stated that the PLA was assisting (*xiezhu*) public security and People's Armed Police (PAP) personnel to enforce martial law in the capital. The notice continued that the PLA were not in the city to deal with (*diufu*) the students but to punish active criminal elements.[360]

Enforcement of Martial Law

The second period began on June 3 when troops first opened fire on crowds in Beijing and lasted until calm had been restored throughout the city. Stern warnings were

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[356] GWYGB, No. 6, April 27, 1989, p. 249.

[357] "Martial Law: Declared But Not Enforced," *Beijing Review*, 29 May - 4 June, 1989, pp. 9-11.

[358] "*Beijingshi Renmin zhengfu ling* (*dierhao*)" [Beijing Municipal People's Government order no. 2], in GWYGB, No. 9, 25 June, 1989, p. 393.

[359] Ibid., pp. 393-94.

[360] "*Gao Beijingshi shimin shu*" [Notice to Beijing inhabitants], cited in General Political Department Propaganda Section and *Jiefangjun bao,* editors, compilers, *Huwei shehuizhuyi gongheguo* [Defend the socialist republic], Beijing: Changzheng chubanshe, 1989, pp. 41-42.

broadcast over radio, television and loudspeakers, warning people to clear the streets and stay in doors or face the consequences. There was at least one official notice issued that afternoon by the MLEC of the PLA, and at least three issued jointly by the MLEC and the Beijing municipal government. Although worded slightly differently, the notice issued by the MLEC and the first notice issued jointly contained the same message: civilians should not impede the progress of troops enforcing martial law and troops were empowered to use all means including force to deal with infractions.[361] A second notice issued jointly by the MLEC and Beijing authorities warned people to keep off the streets and away from Tiananmen Square,[362] while a third joint warning urged people to stay indoors.[363]

Significantly, these were the first notices regarding martial law in two weeks and the first formally issued by **both** the MLEC and the municipal authorities. In retrospect these clearly represented a new resolve by the regime to use lethal force.[364] However, the escalation of the stakes was far from apparent to the residents of Beijing at the time. The fact that the flurry of warnings were issued by both civil and military authorities instead of simply one or the other would not necessarily have not been viewed with any significance by the demonstrators. Meanwhile the wording of the bulletins was similar to those of previous ones. The threat in the joint communiqué to use "all means" was the same used in the first order issued by Chen Xitong two weeks earlier. There was little reason to take the renewed warning more seriously than the original.

When shooting began on Saturday evening, people at first refused to believe that troops were using live ammunition. Violent clashes continued on Sunday as civilians fought bloody skirmishes with troops. Soldiers fired on demonstrators and rioters alike, and civilians fought back with bricks, Molotov cocktails and anything else handy. One thousand motor vehicles were reportedly destroyed, thousands of people were injured and approximately two thousand people--most of them civilians-- were killed during these two days.[365]

By the afternoon of Sunday, June 4, the streets had largely been cleared of protestors and were in the control of martial law troops. In the days following, however,

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[361] For the text of the MLEC notice, see *Xinhua,* 3 June 1989, translated in FBIS, 5 June 1989, p. 76. For the jointly issued notice, see *China Daily*, 5 June 1989, translated in FBIS, 5 June 1989, p. 76.

[362] Ibid., pp. 76-77.

[363] *Xinhua,* 3 June 1989, translated in FBIS, 5 June 1989, p. 77.

[364] On the decision to use lethal force, see Scobell, "Why the People's Army Fired on the People," p. 199.

[365] Chen Xitong stated in his report to the NPC Standing Committee that 200 died and 3,000 were injured. See "Quarterly Chronicle and Documentation," *China Quarterly*, No. 120, December 1989, p. 944. State Council Spokesman Yuan Mu reported 300 deaths. See "State Council Spokesman Yuan Mu Held a Press Conference...," in *The June Turbulence*, Beijing: New Star Publishers, 1989, p. 5. Nicholas Kristof estimated between 400 and 800 people died. See Kristof, "China's Untold Story: Who Died in the Crackdown," *New York Times*, 3 June 1990, p. 20. Amnesty International estimated that at least 1,000 people died. See *People's Republic of China: Preliminary Findings on the Killings of Unarmed Civilians, Arbitrary Arrests and Summary Executions Since June 3, 1989*, New York: Amnesty International Publications, 1989, p. 22. One scholar, after careful evaluation, estimates that some 2,600 persons were killed. Timothy Brook, *Quelling the People: The Military Suppression of the Beijing Democracy Movement,* New York: Oxford University Press, 1992, p. 169.

sporadic clashes between soldiers and civilians continued.[366] Announcements on Monday June 5 ordered people to stay home and not to report to work on Tuesday and Wednesday.[367] For at least several days after June 3-4 there were attacks on army patrols by civilian snipers as well as attacks by soldiers on civilians who were violating curfews.[368] During the week following June 3-4 troops and police detained thousands of people.[369] Overzealous men in uniform indiscriminately rounded up people suspected of wrongdoing with excessive force: this much has been acknowledged by *China Youth News*.[370]

On Thursday June 8, three decrees were issued jointly by the MLEC and the municipal government. The first forbade people from blocking streets, damaging automobiles and traffic control equipment or interfering with police engaged in traffic control.[371] A second notice declared the Beijing Autonomous Student Federation (*Gaozilian*) and the Beijing Autonomous Worker's Federation (*Gongzilian*) illegal organizations.[372] A third jointly issued statement gave special telephone numbers that members of the public could call to report "crimes" to the authorities.[373] The following day, June 9, another notice was issued jointly by the MLEC and municipal government banning the production or distribution of posters or leaflets of any sort.[374] Then on June 10 another joint bulletin urged criminals to turn themselves in or members of the public to turn in criminals.[375]

Calm gradually settled on the capital as the corpses and debris were removed from the streets. Perhaps the event that marks the close of the enforcement stage was Deng Xiaoping's address to MLEC commanders on June 9. Deng commended them on successfully crushing the "counterrevolutionary rebellion" and restoring order in Beijing.[376]

Maintenance of Martial Law

The third period of martial law began in mid-June following the suppression of all overt resistance to the martial law troops. However, the situation was far from normal: while sniper attacks ended, resistance to martial law continued. There were sporadic violent and sometimes deadly attacks on martial law troops. In the three month period following June 3-4 there were reportedly more than 160 civilian attacks against troops

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[366] Kyoto (Tokyo), 5 June 1989, translated in FBIS, 5 June 1989, p. 78.

[367] Ibid.

[368] Yi and Thompson, *Crisis at Tiananmen*, pp. 94-95; *Tang tai* (Hong Kong), 12 May 1990, translated in FBIS, 18 May 1990, pp. 16-17.

[369] Amnesty International, *People's Republic of China*, pp. 27-28.

[370] The report actually states that a poll of workers in the capital showed that many believed "some people were wrongly arrested and beaten during the early days of putting down the rebellion." Cited by *AFP*,10 October 1989, translated in FBIS, 10 October 1989, p. 22.

[371] *Xinhua* , 8 June 1989, translated in FBIS, 8 June 1989, p. 10.

[372] Ibid., pp. 10-11.

[373] Ibid., p. 11.

[374] *Xinhua,* 9 June 1989, translated in FBIS, 12 June 1989, p. 25.

[375] *Xinhua,* 10 June 1989, translated in FBIS, 12 June 1989, p. 25.

[376] Yi and Thompson, *Crisis at Tiananmen*, pp. 188-94.

enforcing martial, law resulting in at least 30 PLA fatalities.[377]

Tiananmen Square remained closed to the public and authorities remained vigilant against any signs of protest. During the final months of 1989 PLA troops were gradually withdrawn from the capital, and then just prior to the formal lifting of martial law in January 1990 the army relinquished its duties to the PAP. Some reports allege that PLA troops merely removed their army uniforms to don PAP uniforms and remained on the streets of Beijing.[378]

The Administration of Martial Law

In both Lhasa and Beijing the manner of how martial law was to be imposed, enforced and maintained was left to the discretion of the authorities of the respective province-level jurisdictions. Other than the initial order invoking martial law and the final order lifting it, no major notices or communiqués on martial law are known to have been issued by the State Council or other national level bodies. Martial law orders and bulletins were of three types: those issued by regional civil authorities alone, those issued by civil and military authorities jointly, and those issued by the military authorities alone. Of the dozen-odd martial law orders and communiqués issued in Beijing, all but two were jointly issued by the Beijing municipal government and the martial law command. Although this gives the impression that military and civilian organs jointly administered martial law in Beijing, Chinese legal scholars stress that the type of martial law imposed in 1989 and 1990 corresponds to that in which the military merely assists (*xie zhu*) civilian authorities in performing their duties.

In the case of Lhasa on paper the civil government of the Tibetan Autonomous Region (TAR) seemed to be administering the implementation and regulation of martial law. Six decrees were issued by the government of the TAR and signed by Chairman Doje Cering.[379] These orders detailed the area under martial law, the hours of curfew and other regulations, bans on strikes, demonstrations, and authorized law enforcement personnel and troops to cordon off the area under martial law, to search premises, and to stop and check motor vehicles and pedestrians.

Certainly civilian courts continued to function, and it appears that violators of martial law orders were tried in civilian courts rather than military ones in both Lhasa and Beijing. In the national capital, defendants--ranging from prominent student leaders and intellectuals accused of masterminding the rebellion to workers charged with violent crimes--were prosecuted in civilian courts.[380] While the exact nature and extent of military involvement in legal affairs during martial law is not clear, PLA legal organs reportedly did play an "active role" in the administration of martial law justice in Beijing. Military courts "at various levels actively gave publicity to the legal system, and exposed

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[377] *Tang tai* (Hong Kong), 12 May 1990, translated in FBIS, 18 May 1990, pp. 16-17.

[378] Nicholas D. Kristof, "With Martial Law Lifted, An Eerie Quiet in Beijing," *New York Times*, 11 January 1990, p. A10.

[379] Hao Chiyong, "Martial Law—An Indispensable Emergency Measure," p. 38.

[380] Asia Watch, *Punishment Season: Human Rights in China After Martial Law*, New York and Washington: Asia Watch, March 1990; and George Black and Robin Monroe, *Black Hands of Beijing*: *Lives of Defiance in China's Democracy*, New York: John Wiley and Sons, 1993.

the illegal and criminal nature of turmoil and riots."[381] In addition, twenty-eight PLA legal functionaries in Beijing "got directly involved in enforcing martial law and carrying out martial law-related work...."[382]

In Lhasa and Beijing those arrested for violent crimes were given speedy processing by judicial organs and given heavy punishment including the death penalty.[383] The courts of Lhasa were even commended by the TAR government and party committee for their swift and enthusiastic punishment of rioters.[384] These steps, however, were adopted by the criminal justice systems of both cities and not military courts. Moreover, these measures to deal with dissidents and rioters should not be viewed as extraordinarily harsh or unusual means tailored specifically to martial law conditions. Rather, they represent business as usual by an authoritarian regime employing powers formally granted and practices tested long before martial law was invoked in either city.[385]

Lifting of Martial Law

Martial law was lifted in Beijing by State Council decree on January 11, 1990, after being in effect for seven and a half months. Martial law was lifted in Lhasa by State Council decree on May 1, 1990, after being in place for 13 months. Not surprisingly the Chinese authorities played up the end of martial law in each city. One commentator asserted that the lifting of martial law in the Chinese capital was "a display of confidence and strength by the authorities." He continued that, "the situation in Beijing has now returned to normal," and "stability" is the watchword.[386] According to a weekly aimed at overseas Chinese, martial law was lifted in Lhasa because: "the situation in Lhasa and Tibet has become stable." Public order had been fully restored, and both industrial and agricultural production was now thriving.[387]

However, foreign experts and commentators tended to insist that the lifting of martial had little meaning. One respected Hong Kong weekly argued that the lifting of marital law in Beijing amounted to only a "cosmetic change." It was, according to the *Far Eastern Economic Review,* "a purely symbolic gesture" by the regime "aimed at

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[381] *Jiefangjun bao*, 10 January 1990, translated in FBIS, 1 February 1990, p. 18.

[382] Ibid.

[383] Asia Watch, *Punishment Season*. Also on Lhasa, see Hao Chiyong, "Martial Law—An Indispensable Emergency Measure," p. 38.

[384] *Xinhua* (Tibet), 11 March 1990, translated in FBIS, 14 March 1990, pp. 41-42.

[385] The same basic point is made by the Asia Watch, *Punishment Season*. For a comprehensive survey of the criminal justice system in Deng's China, see Shao-chuan Leng and Hungdah Chiu, *Criminal Justice in Post-Mao China: Analysis and Documents,* Albany, NY: State University of New York Press, 1985. The death penalty, for example, invoked to deal with at least forty individuals convicted of violent acts related to protests against martial law in various Chinese cities in mid-1989 has been used consistently and vigorously by the authorities in post-Mao China. The death penalty, for example, invoked to deal with at least forty individuals convicted of violent acts related to protests against martial law in various Chinese cities in mid-1989 has been used consistently and vigorously by the authorities in post-Mao China. See Andrew Scobell, "The Death Penalty Under Socialism, 1917-1990: The Soviet Union, the People's Republic of China, Cuba and the German Democratic Republic," in *Criminal Justice History*, Vol. XII, 1991, p. 207.

[386] *Banyuetan* [Bimonthly talks], 25 January 1990, translated in FBIS, 13 March 1990, pp. 20-21.

[387] Sang and Hua, "Tasks of Martial Law in Lhasa," p. 66.

improving its international image."[388]   There is some truth to these allegations. Some of the most important provisions in effect under martial law remained in effect because they were codified into new laws and regulations restricting demonstrations and press coverage.[389]

Significance of the Imposition of Martial Law in 1989

Perhaps the most important reason why the regime decided to impose martial law in parts of the Chinese capital in May 1989 is simply this: because it had worked in Lhasa two months earlier, and it had worked in Poland some seven years before. The disturbances in the Tibetan capital had subsided quickly after martial law was instituted. According to the *People's Public Security News* of March 24, 1989: "The situation in Lhasa soon returned to normal following the effective implementation of martial law...."[390] The Lhasa example demonstrated that martial law could work in China, but it was very much a response to a local crisis, and the decision to impose martial law there was a less complex matter that generated little if any controversy among the PRC central leadership. The case of Poland in December 1981, however, probably seemed more relevant to the situation faced by Deng Xiaoping and other elderly Chinese leaders. Faced with a nation-wide crisis that fundamentally threatened to undermine the authority of the communist regime, Polish leader Jaruzelski skillfully suppressed the unrest, restored order and defused at least temporarily a very complex and explosive situation. Deng was greatly impressed by the ability of the Polish authorities to swiftly bring "the situation under control through martial law."[391]

When the Chinese party-state declared martial law in Lhasa and Beijing it suggested four factors were at work. First, the declaration of martial law in May 1989 was a "psychological device,"[392] an attempt by the regime to intimidate the protesters. The declaration of martial law in Beijing was meant to serve as a stern warning to students and others that the government would use force if necessary to end the demonstrations. Senior Chinese leaders appear to have expected that the mere announcement of martial law and a show of force would overawe the students who would finally end their demonstrations and vacate Tiananmen Square.[393] "Once martial law is

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[388] Tai Ming Cheung, "Cosmetic Change: Martial Law Ends, But It Means Little To The People," *Far Eastern Economic Review*, 25 January 1990, pp. 8-9. A similar response greeted the lifting of martial law in Lhasa a few months later. See, for example, *Far Eastern Economic Review*, 10 May 1990, p. 12.

[389] Similar allegations were also made when martial law was lifted by Poland's Military Council of National Salvation in December 1982 and when Taiwan's President Chiang Ching-kuo took the same step in July 1987. On Poland, see The Lawyers Committee for International Human Rights, *Poland: The Lifting of Martial Law--An Illusion of Progress*, New York: Lawyers Committee for International Human Rights, March 1983. On Taiwan, see Copper, "Ending Martial Law in Taiwan." A Taiwan government spokesmen acknowledged to a British newspaper that part of the logic in lifting martial law was that it would improve the regime's image internationally. *See The Daily Telegraph* (London), 15 August 1987.

[390] Hao Chiyong, "Martial Law—An Indispensable Emergency Measure," p. 37.

[391] "Party Documents on Anti-Bourgeois Liberalization," p. 20.

[392] "An Outbreak of Martial Law," Time Magazine, 25 September 1978, p. 40.

[393]   Lucian Pye also makes this point. See Lucian W. Pye, "Appealing the Tiananmen Verdict: New Documents from China's Highest Leaders," *Foreign Affairs,* Vol. 80, No, 2, March/April 2001, p. 152.

declared the important thing is the threat that the army will represent," said Politburo member Qiao Shi at a key meeting of senior leaders held on the evening of May 18 held at Deng's home.[394] However, the Public Security Bureau, the PAP, and the PLA all seemed either unwilling or unable to back the regime. Initially the intimidation factor failed miserably in 1989 Beijing. It was not until the weekend of June 3-4 that the residents of the capital began to take martial law seriously.

Second, the declaration of martial law was meant to be a dramatic way of signaling that the military backs the regime. According to legal scholar Farooq Hassan, "martial law is a political weapon to show that no matter how unpopular the regime in power, it still has the support of the army."[395] Unfortunately for the Beijing regime, this was not the message received by the student protesters until the weekend of June 3-4, 1989. Prior to that, the signal had been confused and contradictory. It was not at all clear to demonstrators and Beijing residents, for example that the PLA wholeheartedly supported the regime, since individual active duty officers and retired veterans, for example, spoke out publicly against using troops to end the protests.[396]

Third, a declaration of martial law meant the regime felt it necessary to justify or rationalize heightened repression by giving it some basis in law. The declaration of martial law in Lhasa and Beijing in 1989 and its lifting the following year is a clear example of a regime using "the law" to legitimate its domination (in the Weberian sense) of a society. The CCP continues to seek a rational-legal justification for its authoritarian rule.[397]

Fourth, it indicated that the regime believed it was embroiled in a "life or death crisis."[398] Such a move is a strong signal about the depth of concern among a regime's leadership. In the case of Beijing in 1989, it indicated that China's elderly leaders truly believed they faced a counterrevolutionary rebellion threatening the very existence of the regime.[399] However, the extent of this fear among the octogenarians--which appeared to border on paranoia--was not communicated to the demonstrators. Thus Chinese protesters seemed to think the declaration of martial law represented simply a ploy to deprive the people of their right to demonstrate peacefully.

THE PROMULGATION OF *JIEYAN FA*

The approval of the PRC's Martial Law (*Jieyan Fa*) by the Eighth National People's Congress on March 1, 1996, and its passage into law on the same day by President Jiang Zemin has been virtually ignored by analysts including those who study the PLA. Certainly the legislation is just one piece of a tidal wave of 118 legislative

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[394] *The Tiananmen Papers*, p. 210.

[395] "An Outbreak of Martial Law".

[396] See Scobell, "Why the People's Army Fired on the People."

[397] The same point has been made regarding the ROC's use of martial law on Taiwan. See Richard C. Kagan, "Martial Law in Taiwan," *Bulletin of Concerned Asian Scholars*, Vol. 14, No. 3, July-September 1982, p. 50.

[398] Indeed, this is the term Deng used in a meeting on May 21, 1989. See *The Tiananmen Papers*, p. 257.

[399] See, for example, Scobell, "Why the People's Army Fired on the People," pp. 196-97. See also the discussions of senior leaders transcribed or summarized in *The Tiananmen Papers*.

items approved by the Eighth NPC between 1993 and 1997.[400] Moreover, PLA watchers were overwhelmed by the promulgation between 1978 and 1998 of "13 sections of military law, over 100 military and administrative laws and regulations, and more than 1,000 military regulations."[401]

When one examines the 32 articles contained in the *Jieyan Fa's* five chapters, three main themes are readily apparent. First of all, the designated first responders in a martial law situation are the regular police and the paramilitary PAP.   Article Eight of the law explicitly states that: "Martial law will be executed by the People's Police and the People's Armed Police." The PLA should only be deployed if the police forces are unable to cope with the situation: "If necessary, the State Council can refer to the Central Military Commission for a decision on sending People's Liberation Army units to assist (*xiezhu*) in martial Law enforcement" (art. 8).

A second fundamental theme in the legislation is that civilian governmental organs are given responsibility to make all decisions concerning the imposition, enforcement, and lifting of martial law. Civilian authorities at the various levels (national, provincial, and local) are technically to be in overall control, not the police, armed police, or military, which are simply acting at the direction of civilian state entities.

Specifically, the power to "implement martial law…rests with the State Council" (art. 4). Article 3 states it is the State Council that decides if martial law should be imposed in part of province-level jurisdiction and it is the Premier who promulgates the decree. However, if turmoil erupts suddenly in a locality then the local authorities can seek immediate consent from the State Council to deploy troops prior to a formal declaration of martial law by the Council. It is the Standing Committee of the NPC that must decide if martial law is necessary for the entire country or an entire province-level jurisdiction and the President who formally issues the order. Article 17 states that the people's government at the county level or above may, if necessary, temporarily requisition property, facilities, vehicles or equipment (art 17). Therefore, martial law does not mean military rule or military control.

A third theme is the considerable flexibility and autonomy provided to security forces implementing martial law. "Martial Law Enforcement organs (*ji guan*) are granted broad powers: they can formulate regulations, imposing curfews, control traffic, inspect papers, issues passes, search vehicles, censor the press or telecommunications, and regulate access to the area under martial law, as well as ban strikes and demonstrations (arts. 13, 14, 15, 25). Martial law personnel can also detain people (arts. 23, 24) and seize property--without prior approval of the relevant civilian authorities if necessary (art. 17). The enforcement institutions can also control the supply and provision of "basic daily necessities," including regulating prices (art. 19).

The *Jieyan Fa* also gives Martial law personnel the power to use "police instruments (*jing xie*) to forcibly stop or disperse crowds if persuasion proves useless"(art

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[400] The *Jieyan Fa* was the first of 22 pieces of legislation passed by the NPC in 1996. See the National People's Congress Standing Committee Work Report delivered by its Vice Chair Tian Jiyun at the first session of the 9th NPC on March 10, 1998. See *Xinhua*, 22 March 1998 translated in FBIS, 23 March 1998.

[401] *Xinhua,* 9 December 1998, translated in FBIS, 11 December 1998 cited in Bickford, "Regularization of the Chinese People's Liberation Army," p. 463.

26). Moreover, personnel are permitted to use "guns and other weapons if police instruments prove to be of no avail" (art. 28).

Significance of the 1996 *Jieyan Fa*

First, the *Jieyan Fa* provides further legal justification for the domestic deployment of the military. The constitutional rationale was provided in Article 28 of the 1982 PRC constitution: the state was responsible for "maintaining public order." Article 29 of the Constitution charged the PLA with a variety of missions, including "safeguarding the people's peaceful labor." While mentioned in the 1982 PRC constitution, until 1996 martial law had no other legal basis or framework. With the promulgation of martial law legislation the legal grounds for deploying military force to deal with a domestic crisis were further solidified. A year after the *Jieyan Fa* went into effect, the newly promulgated 1997 PRC National Defense Law quoted word for word portions of the Constitution's article 29, including that one of the key tasks of the PLA is "to safeguard the people's peaceful labor."[402] The latter point is enshrined in subsequent legislation and official documents.

Second, China's political and military leaders, who feel they were victims of the incompetence of PRC civilian leaders in 1989, want if possible to keep the PLA out of frontline duty of internal security since they are likely to have substantial reservations about a decision to institute martial law again. The promulgation of the *jieyan fa* in March 1996 is aimed in part at reassuring the military that next time the measure is invoked, it will be done in a smooth and efficient manner and, if at all possible, without the central involvement of the PLA.. In line with the 1985 "strategic shift" identified by Paul Godwin and others, the PLA is to focus more on external security and confronting a foreign adversary at or beyond China's borders. In keeping with this shift the PAP has ostensibly replaced the PLA as the shock troops for confronting domestic unrest. Article 22 of the National Defense Law states that the PAP is charged with the missions of "safeguarding security and maintaining public order." The same article states that the PLA "*may assist* in maintaining public order according to the law." The PRC Defense White Papers of 1998 and 2000 each contain identical language on the same point: "The PLA, when necessary, assists in the maintaining of public order according to the law."[403]

Third, the *Jieyan Fa* is part of a larger and ongoing effort at developing an effective post-1989 crisis management mechanism. While martial law proved extremely useful to the regime in 1989, the rather haphazard manner in which the measure was carried out in Beijing and the military massacre suggest that authorities would have been very hesitant to reactivate the measure in the future without careful preparation and additional codification.   In the wake of Zhongnanhai's slow response to the public outrage against the 1999 Belgrade embassy bombing, there was recognition that a more effective and responsive mechanism for reacting to crises was needed. The formation of

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[402] Article 17 of the National Defense Law of the People's Republic of China adopted March 14, 1997 by the Fifth Session of the Eighth NPC, in *Xinhua,* 18 March 1997, translated in FBIS, 24 March 1997.

[403] *2000 nian Zhongguo de guofang*, [China's 2000 National Defense], Beijing: Zhonghua Remin Gongheguo Guowuyuan Xinwen Bangongshi, 2000, p. 17.

a coordinating group envisioned as a kind of Chinese- style National Security Council also may be linked although it appears to be a mechanism by which Jiang Zemin is endeavoring to prolong his political life. There is no mention of any similar measures used by the government in times of emergency, such as the use of the PLA to restore order in 1967. There is no mention of this important episode, either to cite its relevance as a significant and positive precedent, or as a negative example, to highlight the differences between *jun guan* in 1967 and *jieyan* in 1989. The authorities obviously desire to ignore this earlier episode.[404]

CONCLUSION: "MARTIAL LAW LITE"?

This case study offers important insights into both the continuity and change in China's national security policy. There are two main elements of continuity: the practice of rule by law and civilian supremacy. First, martial law legislation is an integral part of the process of codification and regularization of national security affairs. The fundamental rationale of the regime is that martial law is an essential instrument of state power: all countries have it and so must China. Promulgating the *Jieyan Fa* was an effort to refine and clarify the measure.

Second, martial law in the Chinese context is not synonymous with military rule or military control. Instead, martial law in post-Deng China means the political leaders are still technically in control. The military does not take over the reigns of power from the legally constituted civilian government. Instead, martial law troops merely "assist" the civilian authorities. The *Jieyan Fa* clearly is intended to underscore that the conceptual formulation of civil-military relations summarized as "the party commands the gun," also applies in crisis situations. In short, martial law constitutes "military aid to the civil [authorities]."

There have also been some significant changes in Chinese thinking about national security policy since 1989. In particular Chinese thinking has evolved in two key areas: the type of crisis meriting martial law and the role of the military in internal security. First, the *Jieyan Fa* underscores Beijing's growing obsession with preserving domestic stability in the face of alarming evidence of rising discontent in both urban and rural areas populated by Han Chinese and in ethnic minority-inhabited border areas. Martial law has shifted from a general-purpose measure employed to deal with a variety of crises to a move intended to deal specifically with civil unrest or domestic revolt. No longer is martial law also used in case of war, invasion, economic crisis, or natural disaster. Hence, regular courts continue to function, and there is no need to suspend the regular criminal justice system. Military tribunals do not try civilian defendants. I am not aware of any civilians being dealt with by military courts in 1989, although, of course, this does not mean that this did not happen. As noted above, PLA legal personnel were active in 1989-1990, but this appears to have been more as advisors to the troops than as judges or prosecutors.

Second, the passage of the *Jieyan Fa* highlights the ongoing effort to make the

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[404] In the first official effort at a comprehensive history of the Cultural Revolution, for example, there is only <u>one</u> reference in passing to the imposition of *jun guan*. Interestingly, this single mention is a derogatory one. See Yan Jiaqi and Gao Gao, *Zhongguo 'wenge' shinianli* [A Ten Year History of the Chinese Cultural Revolution], n.p: Zhongguo wenti yanjiu chubanshe, n.d., p. 294.

PLA focus on external security and give the PAP primary responsibility for internal security. Martial law has gone from being synonymous with military deployment to constituting essentially paramilitary deployment. The declaration of martial law in Beijing on May 20, 1989, signaled the intervention of the PLA in the crisis. The MLEC appears to have been essentially a PLA institution. But the 1996 *Jieyan Fa* stipulates that the first responders are Public Security Bureau units and the new improved People's Armed Police. The PLA will only be called upon if these forces are insufficient. While the PAP units were deployed in Beijing with riot control equipment, the result was a fiasco.[405] Over the past decade considerable effort has been made to make the PAP a more potent paramilitary force, capable of dealing with internal unrest, which has had mixed results.[406]

Thus, in the post-Deng era, the enforcement of martial law is first and foremost the responsibility of regular police and PAP troops. PLA units are not to be involved unless absolutely necessary. While it appears that the PAP provided the lion's share of the manpower to enforce martial law in Lhasa, this was not the case in Beijing. Indeed, the intent of China's leaders in imposing martial law in the capital was to have the PLA takeover from PAP and PSB personnel. President Yang Shangkun explained the need for martial law to a gathering of party, government and military leaders on the evening of May 19, 1989. Yang said: "…[W]e have no choice but to call them [PLA troops] in, because the Beijing police could no longer maintain order. Officers of the PAP and Public Security have been working almost around the clock for the past month, and many comrades, going without sleep for two or three days, were exhausted and ill. That is why we thought we needed the PLA to restore order."[407]

In the final analysis, promulgation of the 1996 *Jieyan Fa* represents a partial victory for the PLA: on the one hand the law specifically keeps the PLA off the front line; on the other hand it explicitly sets out procedures that lead to the deployment of the army. The PLA's experience in Beijing was unpleasant and not one military leaders would like to repeat.

Whatever the future holds, for the Chinese people and their leaders, the meaning of martial law will forever be linked with memories of 1989. It is the experience of 1989 Beijing that will be on the minds of the officers and men of the PLA when they are next called upon to enforce martial law.

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[405] Scobell, "Why the People's Army Fired on the People."

[406] Tai Ming Cheung, "Guarding China's Domestic Front Line: The People's Armed Police and China's Stability," *China Quarterly*, No. 146, June 1996, pp. 525-547; Murray Scot Tanner, "The Institutional Lessons of Disaster: Reorganizing the People's Armed Police After Tiananmen," in James Mulvenon and Andrew N.D. Yang, ed., *The People's Liberation Army as Organization: Reference Volume v1.0*, Santa Monica, CA: RAND, CF-182-NSRD, 2002; and Murray Scot Tanner, "Cracks in the Wall: China's Eroding Coercive State," *Current History,* Vol. 100, No. 647, September 2001, pp. 243-249.

[407] *The Tiananmen Papers*, p. 210.

## 6.	CHINESE C4I MODERNIZATION: AN EXPERIMENT IN OPEN-SOURCE ANALYSIS

By James C. Mulvenon

INTRODUCTION

Few PLA topics are as inaccessible as C4I (command, control, communications, computers, intelligence). Unlike doctrine or civil-military relations, where the largely theoretical nature of the discussions permits academic discourse as well as dialogue between the intelligence community and the PLA studies community, information concerning China's C4I developments are among the most heavily protected data within the U.S. system, mainly for reasons of sensitive sources and methods. Yet in recent years the Chinese themselves have begun to discuss this issue in some open sources and grey materials, though the specific details are often obfuscated. This paper examines these new sources, mines them for an tangible information, and attempts limited analysis of the subject, with the usual caveats about the dangers of relying on possibly incorrect, ill-informed or deceptive information.

Historical Evolution

A recent historical survey of Chinese military telecommunications offers some insights into the evolution of the PLA's C4I infrastructure.[408] During the War of Resistance Against Japan, for instance, the No. 3 Bureau of the Central Military Commission built eight large radio stations in a mountain valley in the west of Yanan for the use of the Central Committee. The valley, which stretched for dozens of kilometers, contained "a party station, war information station, strategic station, rear station, intelligence station, news station, friendly forces station, and friendly parties station." Propaganda at the time declared that the army had transformed the terrain into a "valley of red electromagnetic waves." The No. 3 Bureau also built some eight large radio telecommunications networks, such as political, military, economic, intelligence, news, as well as other telecommunications networks. In the meantime, it also managed to build an internal telephone network for the party, government, or military organs in the Yanan area and a long-distance cable telecommunications network for the Shaanxi-Gansu-Ningxia region as well. In a dedicatory inscription he wrote for the signal troops, Mao Zedong praised signalmen as "scientific clairvoyants and clairaudients."[409]

After Liberation, the Beijing leadership decided to set up separate telecommunications systems for the party, government, and military. Accordingly, a Ministry of Posts and Telecommunications and a telecommunications department of the

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[408] Zhang Fuyou, "With Joint Efforts Made by Army and People, Military Telecommunications Makes Leap forward," *Jiefangjun bao*, 27 September 2000, p. 9.

[409] Zhang Xiaojun, "Modern National Defense Needs Modern Signal Troops," *Guofang*, 15 October 1995, No.10, pp. 20-21.

Central Military Commission was established, along with a national telecommunications network comprising one public network (a state telecommunications network) and two specialized networks (a military telecommunications network and a railroad telecommunications network). By the end of 1950, Ministry of Posts and Telecommunications had built a long-distance telecommunications line, stretching from Beijing to Nanjing, Shanghai, Manzhouli, and Guangzhou, and the army had also built a separate long-distance telecommunications line that sometimes paralleled the civilian system by nailing an iron wire to posts and telecommunications poles along the road.

In the early 1950s, operational requirements drove the leadership to pursue three command and control projects. In autumn of 1952, as the Korean War entered its second year, Premier Zhou Enlai instructed the general departments under the Central Military Commission and Ministry of Posts and Telecommunications to rapidly build a telecommunications line for the units which had already deployed to the DPRK. Inspired by such the slogan "Everything for the war; Everything for the front," the project was completed on 20 April 1953. As a result, the Volunteers were able to hear the voices of the CPC Central Committee and Chairman Mao directly via radio broadcast. Meanwhile, more than 3,000 telecommunications soldiers and 600 staff and workers from the posts and telecommunications sector built an open-wire telecommunications line linking Chengdu with Lhasa, permitting the Central Committee and the Central Military Commission to direct operations aimed at suppressing bandits in the Southwest. Finally, the CPC Central Committee and the Central Military Commission during this period also ordered the construction of an underground command center primarily for military use, which would link up the party and government organs concerned and install radio telecommunications equipment.[410]

The vulnerability of the PLA's C3I system was exposed during the 1969 border clash with the Soviet Union, when Chinese C3I nodes on the front lines were successfully jammed by Soviet electronic warfare.[411] As a result, forward units were often cut off from communication with their chain of command. A close relative and military associate of Mao, General Kong Congzhou, drafted an after-action report to the top leadership, in which he argued that the entire C3I apparatus would be unlikely to survive conventional and electronic attack in an all-out war.[412] As a result, Beijing ordered a significant modernization of the military's C3I system. You Ji divides this program into three phases: (1) early 1970s to early 1980s; (2) the remainder of the 1980s; and (3) the 1990s.[413]

In the first phase, China sought to build a credible national C3I system down to the corps level. It involved four large projects. The first was an underground defense telecommunications network, with a total length of 53,000 kilometers, linking Beijing and eighty-six provinces. Second, twenty-nine underground telecommunications command centers were created, connected by 14,000 kilometers of underground cable and 5,000 kilometers of underwater cable. In addition, the military laid 10,000 kilometers

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[410] The command center in question may be the Western Hills [*Xishan*] complex.

[411] This incident is described in You Ji, *The Armed Forces of China*, New York: I.B.Tauris Publishers, 1999.

[412] Kong Congzhou, *Kong Congzhou huiyilu*, Beijing: Jiefangjun chubanshe, 1991.

[413] The elaboration of these three phases is taken from You Ji, *The Armed Forces of China*, New York: I.B.Tauris Publishers, 1999, pp. 70-74.

of communications lines to connect defense outposts in north China, northeast China, and northwest China. Third, the lines of the national defense communications system were upgraded by replacing "the existing underground cables into wave-carrier channels with up to 300 lines." Fourth, the military constructed maritime networks, including an ELF transmission center and the construction of the PLA's largest SIGINT center on Hainan Island. By the end of the 1970s, all of the Chinese possessions in the area were connected to the national defense communications system by 1,500 kilometers of seabed electric cables, 8,000 kilometers of open wire, and 5,700 kilometers of microwave trunk lines.[414]

In the second stage of the PLA's C3I modernization (1980s), China enjoyed preliminary success with some ELINT satellites and developing a capability to monitor international satellite communications.[415] Other C3I facilities were built during this period, including the national military command center at the Western Hills and two joint Sino-U.S. SIGINT stations on the Soviet border to monitor missile telemetry and other emissions. On the telecommunications front, three strategic coaxial cables were laid, connecting Beijing to Hangzhou (through Nanjing and Shanghai), Beijing to Guangzhou, and Chengdu/Chongqing to Shanghai. During this phase, communications security improved, with open wire networks replaced by underground and underwater cables for handling sensitive information.[416]

In the third stage (1990s), one of the most important tasks was the construction of a strategic early warning system that was capable of identifying, detecting, and tracking air and space targets from long range.[417] Efforts were focused on overcoming shortfalls in satellite-borne radar, space laser sensors, large-scale phased-array radar, over the horizon radar, and airborne early warning systems.[418] From the early 1990s onward, it was also clear to the leadership that military telecommunications was badly lagging the exploding civil telecommunications sector. Faced with the unattractive option of pouring large amounts of money into an upgraded military system, Jiang Zemin on 7 June 1991 issued the following instruction: "In such a big country as ours, as it is neither possible nor necessary to build separate telecommunications systems for military use and civil use respectively, we should take such a road as building a telecommunications system usable for both military and civil purposes, which meet both peacetime and wartime needs."[419] The implementation of this policy is examined in the discussion of infrastructure in the next section.

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[414] Li Ke and Hao Shengzhang, *Wenhua dageming zhong de renmin jiefangjun* [The PLA in the Cultural Revolution], Beijing: Zhongguo dangshi ziliao chubanshe, 1989.

[415] The PLA launched its first ELINT satellite in 1976, followed by additional birds in the 1980s. ELINT units were even created within the new Group Army structure after 1985.

[416] Defense Intelligence Agency, *China: National Command, Control and Communications (U)*, December 1984.

[417] Guo Xilin, "Dui guojia yujing xitong jianshe wenti de yansuo" [On the construction of a national defense early warning system], *Junshi xueshu*, No. 3, 1995.

[418] Ibid, p. 28.

[419] Zhang Xiaojun, "Modern National Defense Needs Modern Signal Troops," *Guofang*, 15 October 1995, No. 10, pp. 20-21.

THE CURRENT SYSTEM

Strategy and Policy

China's current leadership has consistently recognized the important of modernizing the military's C4I systems. A former Minister of Electronics Industry, Jiang Zemin has emphasized that "electronics is of crucial importance to economic construction and national defense communications."[420] In summarizing the experiences of the Gulf War after 1991, Jiang Zemin went further, asserting that "military electronics has a bearing on national security" and "must be given first place."[421]

In the decade since these comments were made, the PLA's C4I strategies and policies for C4I modernization were developed and promulgated. A 1997 survey article in *Liberation Army Daily* highlights six core transformative principles of the policy: (1) analog technology to digital technology, (2) electric cables to fiber-optic cables, (3) mechano-electrical switches to program-controlled switches, (4) single-function terminals to multi-function terminals, (5) single-tasking networks to multitasking networks, and (6) manual operation to automated and intelligent network management.[422] A 1993 *Liberation Army Daily article* was more specific, asserting that the PLA was moving towards a C4I system based mainly on fiber optic cables, digital microwave, and satellite communications.[423]

By 2000, some additional transformative principles had been added to the strategy, including: (1) stationary telecommunications technology to mobile telecommunications technology; (2) ground and air telecommunications technology to space telecommunications technology; (3) support telecommunications technology to command control technology and information warfare technology; (4) narrow-band telecommunications network to a wide-band telecommunications network; (5) regional or trans-regional telecommunications network into a global telecommunications network; (6) specialized military telecommunications network into a telecommunications network formed by both specialized networks and public networks; and (7) military telecommunications network into a military information network.[424] The latter envisions the fusion of traditional telecommunications networks with advanced computer networks. Moreover, the emphasis has changed from maintaining and operating separate service-based telecommunications networks to the integration of "unified" networks as a first step towards combined arms and joint warfare. Finally, the PLA, particularly at the MR level, seems to be organizing its communications system to facilitate direct command down at least four layers of hierarchy, gradually setting up a command automation system that passes through the levels of the MR, group army, division, and regiment.[425]

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[420] Zhang Xiaojun, pp. 20-21.

[421] Ibid.

[422] Cheng Gang and Li Xuanqing, "Military Telecommunications Building Advances Toward Modernization With Giant Strides," *Jiefangjun bao*, 17 July 1997, translated in FBIS, 20 August 1997; and Li Xuanqing and Ma Xiaochun, "Armed Forces' Communications Become 'Multidimensional'," *Xinhua* Domestic Service, 16 July 1997.

[423] *Jiefangjun bao*, 9 August 1993.

[424] Zhang Fuyou, p. 9.

[425] Ibid.

Infrastructure

A vague 1997 article from *Xinhua* describes the PLA's communications system as comprising underground networks of fiber optic cables, communications satellites, microwave links, short-wave radio stations, and "command automation" (*zhihui zidonghua)* networks which is the PLA's code word for military computer networks.[426] A series of articles in *Liberation Army Daily* between 1995 and 1997 is more specific, describing the C4I system as being composed of at least four major networks: a military telephone network, a confidential telephone network (alternatively described as "encrypted"[427]), an all-army data communications network (also known as the "all-army data exchange network" or "all-army public exchange network"[428]), and a "comprehensive communication system for field operations."[429] A third account merges the two accounts, arguing that the PLA's underground networks of optical fiber cables, communications satellites in the sky, and microwave and short-wave communications facilities in between form the infrastructure for a military telephone network, a secure telephone network, an all-army data communications network, and the integrated field communications network. Specific details about the four networks are scarce, save one. A 1995 article in *Liberation Army Daily* asserts that the army data network, which was begun in 1987, "is responsible for the all-army automatic transmission and exchange of military information in data, pictures, charts, and writing…"[430] By 1995, PLA signal corps had trained over 1,000 technicians, to operate and maintain this system, which covers "all units stationed in medium and large cities across China and along the coast."[431]

Other scattered facts about PLA communications networks can be found in open sources. The navy's sea test range, for example, has reportedly set up a modernized command and control center and a testing network system, utilizing optical fiber, microwave communications and data communications.[432] In September 1999, it was reported that the Second Artillery's optical fiber digital communication system had become operational, giving the strategic rocket forces an "all-weather communication support capability."[433] Up until this point, the Second Artillery were still using communication facilities established in the mid-1960's, employing outdated magnetic

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[426] Li Xuanqing (*Jiefangjun bao)* and Ma Xiaochun (*Xinhua*), "Armed Forces Communications Become Multidimensional," *Xinhua*, 16 July 1997.

[427] Liu Dongsheng, "Telecommunications: Greater Sensitivity Achieved -- Second of Series of Reports on Accomplishments of Economic Construction and Defense Modernization," *Jiefangjun bao*, 8 September 1997, p. 5, translated in FBIS, 14 October 1997.

[428] See Tang Shuhai, "All-Army Public Data Exchange Network Takes Initial Shape," *Jiefangjun bao*, 18 September 1995.

[429] Cheng Gang and Li Xuanqing, "Military Telecommunications Building Advances Toward Modernization With Giant Strides," *Jiefangjun bao*, 17 July 1997.

[430] See Tang Shuhai, "All-Army Public Data Exchange Network."

[431] Ibid.

[432] Ding Yubao and Chen Wanjun, "PRC Navy's Sea Test Range Reaches World Level," *Xinhua Domestic Service*, 14 November 1999.

[433] Zhang Jiajun, "PLA Optical Digital Communication System Operational," *Xinhua Hong Kong Service*, 8 September 1999.

telephones and transmitter-receivers. In 1999, the Guangzhou Military Region announced the creation of the first automated theater command system in the armed forces. According to an official account, the new system's integrated command, control, intelligence processing, communications, electronic warfare, and joint services management features permit ground, naval, and air forces at four levels -- the Guangzhou Military Region and its corps, divisions, and regiments -- to share information.[434]

One apparent geographical focus of PLA communications development efforts has been the northwest portions of the country as well as Tibet. In 1985, the Ministry of Radio, Film, and Television and the then-Ministry of Posts and Telecommunications cooperated with the General Staff Headquarters in building Lhasa's first satellite ground station. The CMC, the General Departments, and the Chengdu Military Region in 1989 appropriated tens of millions of special funds to help Tibet's border defense units upgrade their telecommunications facilities. In 1990, the General Staff Headquarters supplied funds for the Tibet Military District to build a telecommunications building and maintenance station, lay nearly 1,000 kilometers of telecommunications cable, and install several thousand program-controlled exchanges. The Central Military Commission during this period also helped Tibet build four additional satellite ground stations in Cuona, Yadong, and Chayu. In 1995, the GSD implemented the "421 Project" by equipping Tibet's Lhasa, Shannan, Linzhi, and certain other military sub-districts with almost 1,000 program-controlled exchanges. In the same year, Tibet also laid down two long-distance optical fiber telecommunications lines - the Lhasa-Shannan and Lhasa-Rikaze lines, and Tibet Military District's satellite telecommunications network successfully passed a satellite network test and was accepted by the Army's general staff.[435] The Tibet-based units were thereafter allowed to link their satellite telecommunications network with the Army's general satellite telecommunications network. As a result of all of the important changes, the Tibet border defense units

> can make long-distance calls to the whole army through satellites or optical fiber cables. Now orders can be relayed from command posts to frontier sentry posts by telegram or telephone.[436]

Further, over 70 percent of units in 1996 were able to watch CCTV [China Central Television] programs on closed-circuit televisions.

Among units in the northwest, the completion of a 4,000-km optical fiber line prior to 1996 extended automated command functions to combat troops on the periphery. Wired communications of the units at and above the division and regiment level in the region were reportedly 100 percent programmable by the mid-1990s.[437] In 1998, military

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[434] Si Liang, "Chinese Armed Forces Are Increasing Their Capacity for Fighting Electronic Information Warfare," *Zhongguo tongxun she*, 9 August 1999.

[435] Wang Litian and Chen Shirong, "Tibet Military District Builds Satellite Telecommunication Network," *Jiefangjun bao*, 13 February 1996, p. 2.

[436] Zeng Xianglu and Lan Peng, "Tibet Border Defense Units Build Three-Dimensional Telecommunications Network," *Jiefangjun bao*, 18 August 1996.

[437] Ma Sancheng and Zhang Zhanhui, "Northwest `Large Military Communications Network' Realizes Qualitative Leap," *Jiefangjun bao*, 24 April 1996.

units in northwest China had reportedly installed significant amounts of high-technology equipment, including a stored program-controlled electronic telephone switching system, digital telecommunications, satellite telecommunications, optic fiber telecommunications, and national defense multi-channel telecommunications network. By this point, all military units at and above regimental level had also reportedly installed program-controlled telephones.[438]

Fiber Optic Cables. One important development for the PLA communications infrastructure has been the laying of fiber optic lines. From an information security perspective, the advantages of fiber-optic cables are that they can carry considerably more communications traffic than older technologies, transmit it faster (rates of 565 Mbps and higher), are less prone to corrosion and electromagnetic interference, and are lightweight and small enough for mobile battlefield command as well as fixed military headquarters, while at the same time offering much higher levels of operational and communications security. A recent article in the *Wall Street Journal* highlights many of the difficulties that fiber cables pose for the National Security Agency's global SIGINT effort.[439] Indeed, in the 1980s, some U.S. government agencies were opposed to the sale of fiber-optic technologies to the Soviet Union and other countries, including China, for this very reason.

The PLA's interest in fiber optic cables began in 1993, when the former Ministry of Posts and Telecommunications and the General Staff Department Communications Department agreed to cooperate in constructing 100,000km of fiber-optic cable to form the core of China's long-distance, fiber-optic transmission networks and trunk lines.[440] By 1995, the two organizations had jointly constructed 15,000km of fiber, spanning 19 provinces and municipalities. From 1993 to 1998, more than 1 million officers and men worked on these key national optical-fiber telecommunications lines. In 1999, an official source asserted that the PLA and the PAP participated in the construction of more than 10 large optical fiber communication projects.[441] The military reportedly receives a percentage of the fibers in any given trunk for its own use, making disaggregation of military and civilian communications much more difficult, and the army units stationed along the lines have connected themselves to the backbone.

In terms of specific civilian backbone networks, the following table is a partial list of PLA participation in military-civilian fiber optic cable construction.

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[438] Fan Qing and Liu Jun, "Military Phones Open in Northwest," *Xinhua Domestic Service*, 18 July 1998.

[439] Neil King, jr., "Deep Secrets: As Technology Evolves, Spy Agency Struggles to Preserve Its Hearing," *Wall Street Journal*, 23 May 2001, p. A1.

[440] "PLA Helps With Fiber-Optic Cable Production," *Xinhua*, 13 November 1995, translated in FBIS, 13 November 1995.

[441] Luo Yuwen, "PLA Stresses Military-Civilian Unity," *Xinhua Domestic Service*, 5 March 1999.

Table 6.1   Partial List of PLA Participation in Military-Civilian Fiber Optic Construction, 1995-99

Line	Date	Participating Units and Comments
Lhasa to Xigaze	Sept 1995	In September 1995, an optical fiber telecommunications line between formally went into operation. The Tibet Military District built 250km of the 300-km long cable line, logging more than 60,000 man-hours of officers and soldiers in eight months.[442]
Hangzhou-Fuzhou-Guiyang-Chengdu	June 1995	"After receiving a flood-fighting order, officers and men of a certain PLA unit who had just completed the "Hangzhou-Fuzhou-Guiyang-Chengdu" optical fiber communication project plunged into a new battle without taking a break."[443]
SDH optical fiber line	Dec 1995	A key project under the Eighth Five Year Plan, the 840-mile SDH optical fiber line cost RMB220 million.[444] It involved more than 15,000 soldiers stationed in Changchun, and was completed in December 1995 after only 80 days.[445]

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[442] "Troops Participate in Tibet Telecom Project," *Central Television Program One Network*, 16 September 1995; and Lan Peng, "Lhasa-Xigaze Optical Fiber Cable Project Is Underway in Joint Efforts of Army and Locality," *Jiefangjun bao*, 7 May 1995, p.1.

[443] "Troops, Militias Fight Floods in Various Provinces, *Xinhua Domestic Service*, 29 June 1995.

[444] "Changchun Troops Help Build Jilin's Communication Line," *Jilin ribao*, 16 December 1995, p. 1.

[445] Ibid.

Line	Date	Participating Units and Comments
Lanzhou-Xining-Lhasa		Units of the Lanzhou Military Region and Chengdu Military Region by 1997 had completed the Lanzhou-Xining-Lhasa cable, spanning 2,754km of some of China's most inhospitable terrain.[446]
Beijing-Wuhan-Guangzhou	1998	Identified in military newspaper.[447]
Lanzhou-Urumqi-Yili	Sept 1999	The Xinjiang Production and Construction Corps built the communications fiber-optic cable.[448]
Qomolangma area		In May 2000, almost 1,000 officers and soldiers of the Chinese People's Liberation Army (PLA) participated in building the first fiber optical cable project at the Qomolangma area.[449] The 300 km-long cable is being built at a height 5,000 meters above the sea level, winding through numerous mountains and rivers.
N/A	Dec 1999	A certain base is lauded for "taking advantage of the state's long-distance optical fiber cable laying project to 'opportunistically' build the military optical fiber communications network," saving 8 million yuan of funds.[450]
Hohhot-Beihai	April 1998	On 11 April, a brigade of the infantry of the Inner Mongolia military district, totaling 1,200 officers and men, began the construction of the Inner Mongolia section of the optical fiber communication line.[451]

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[446] The plan was first mentioned in Xie Liangjun, "Cable Crosses to 'Roof of World'," *China Daily*, 26 June 1997, p. 1. The completion of the cable was heralded in Ding Daoquan and Fan Qing, "Lanzhou Military Congratulated on Laying Optical Cable," *Xinhua*, 9 October 1997, translated in FBIS, 11 October 1997.

[447] Liu Huadi, "Army and People Join Hands in Developing Telecommunications – Interview with Wu Jichuan, Newly Appointed Minister of Information Industry," *Jiefangjun bao*, 9 April 1998, p. 5, translated in FBIS-CHI-98-119, 29 April 1998.

[448] Xu Jinzhang, "Xinjiang MD Force Building Defends the Border with Outstanding Merit," *Xinhua Domestic Service*, 9 September 1999.

[449] "PLA Troops Work on Fiber-Optic Cable Project in Tibet," *Xinhua*, 11 May 2000.

[450] Zhang Jiajun and Wu Xudong, "Experts of the Second Artillery Corps Enjoy Four 'Prerogatives'," *Jiefangjun bao*, 29 December 1999.

[451] Ma Yuning, Zhang Zhedong, Xu Guozhao, "Construction of Hohhot-Beihai Optical Fiber Line Starts," *Neimenggu ribao*, 13 April 1998, p. 1. "The Hohhot-Beihai communication line is one of the

In addition, the PLA is building its own set of dedicated fiber-optic lines, under a program known as the "975 Communications Trunk Line Project."[452] These networks reportedly connect the central military leadership in Beijing with units down to the garrison level.[453]

Organization of the C4I Effort

The C4I modernization in the PLA is very likely led by the General Staff Department Communications Department (*Zong canmoubu/tongxin bu*). This unit (hereafter referred to as GSD/Comms) is the PLA's signal corps, responsible for building, operating, and protecting the military's communications infrastructure. In a 1999 article in *Chinese Military Science*, former Fourth Sub-Department Director Major-General Yuan Banggen identified network building, network operation, and communications security as the key roles for the units under his command.[454] By performing such varying tasks, GSD/Comms does not have a natural analogue in the U.S. system, but instead appears to be a combination of many U.S. government agencies and offices, including the information assurance offices of the National Security Agency, the Office of the Secretary of Defense for Command, Control, Communications, and Intelligence (OSD/C3I), the Joint Task Force for Computer Network Operations (JTF-CNO), and the Defense Information Systems Agency (DISA). Drawing upon his own signal corps background, David Finkelstein asserts that GSD/Comms could also be described as "the equivalent of a combination of the branch proponency headquarters of the U.S. Army Signal Corps at Fort Gordon, Georgia as well as the former U.S. Army Communications Command, headquartered at Fort Huachuca, Arizona."[455]

The specific roles, missions, and activities of the Communications Department, adapted from the work of David Finkelstein[456], likely include:

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important long-distance optical fiber line project of the Ninth Five-Year Plan of the Postal and Telecommunication Ministry. The optical fiber cable ran from north to south through Inner Mongolia, Shansi, Henan, Hubei, Hunan, and Guangxi. It started from Hohhot to the Beihai city of the Guangxi Zhuang Autonomous Region. The total length is 4,054 km, while the section in Inner Mongolia is 170 km. When the project is finished, its northern end will link with the Beijing-Hohhot-Yinchuan-Lanzhou optical fiber cable and with the Hohhot-Xian optical fiber cable, and its southern end will connect with Guangzhou-Kunming-Chengdu and Beihai-Haikou-Sanya optical fiber cables. In addition, the line has more connection points with other optical fiber cables, thus becoming the core of south-north communication line through China."

[452] "Domestic Fiber-Optic Cable Maker Unveils New Civilian, Military Products," *Source unknown*, 6 October 1997, translated in FBIS, 6 October 1997.

[453] Cheng Gang and Li Xuanqing, "Giant Strides."

[454] Major General Yuan Banggen, "Setting Eyes on Development, Stepping Up Research in Information Warfare Theories and Construction of Digital Forces and Digital Battlefields," *Zhongguo junshi kexue*, 20 February 1999, pp.46-51, translated in FBIS, 6 July 1999.

[455] David Finklestein,, "The General Staff Department of the Chinese People's Liberation Army: Organization, Roles & Missions," in James C. Mulvenon and Andrew N.D. Yang, eds. *The People's Liberation Army as Organization: Reference Volume v1.0*, Santa Monica, CA: RAND, CF-182-NSRD, 2002.

[456] Ibid.

- Developing, constructing, operating, and maintaining the PLA's China-wide operational military command and control system, and the PLA's administrative communication system;
- Working with civilian ministries at the national and provincial levels to enhance China's national communications infrastructure;[457]
- Providing guidance to and oversight of the communications departments in the Military Regions and Military Districts, as well as communications elements of combat units;
- Developing and disseminating strategic, operational, and tactical-level combat communications doctrine for the rest of the PLA;[458]
- Managing high-technology communications research and development institutes that are likely organic to the Comms Department;
- Providing operational and administrative control (OPCON and ADCON) of strategic-level military communications units (probably mobile and fixed-station units) that are likely organic to the Comms Department;
- Probably working with other GSD departments such as the Training Department to promulgate training regulations and standards for signal corps officers, NCOs, and troops;
- Managing military academies that train officers, NCOs, and soldiers in the PLA signal corps;[459] and
- Providing emergency communications and assisting in the restoration of local communications in the interior during natural disasters.[460]

At a lower level of detail, Finkelstein surmises that the GSD Communications Department has the following possible units and roles:

> [the Communications Department] likely has many, many organic units
> and troops that are both involved in fixed-station facilities (for example
> HF, microwave, satcom, telephone switching facilities, or even
> tropospheric scatterer units) as well as mobile (deployable) strategic-level
> communications packages. It also likely means that GSD/Comms has

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[457] The Communications Department has been instrumental in working with the Ministry of Posts and Telecommunications since 1993 to construct a massive nation-wide fiber optic cable system. See "PLA Helps With Optic-Fiber Cable Production," *Xinhua,* 13 November 1995; and Guan Tang and Qiao Linsheng, "Units and People Jointly Lay 10,000-Kilometer Optical Fiber Cable Lines," *Jiefangjun bao*, 9 November 1995.

[458] Cheng Gang and Guan Ke, "Beijing Hosts Ceremony Celebrating Publication of 'Military Communications'," *Jiefangjun bao*, 10 January 1999.

[459] Luo Yuwen, "Zhang Wanian Attends lecture on Military Communications," *Xinhua,* 22 April 1999. This article along with Cheng Gang and Guan Ke (ibid.), refer specifically to the Communications Command Academy in Wuhan.

[460] Hsiao Yueh, "Jiang Zemin Orders PLA to help Combat Floods, Zhang Wannian Orders Emergency Troop Deployments," *Ching pao,* 1 September 1998. According to this article the Communications Department of the GSD provided mobile radio stations, ultra short wave communications, cellular phones, and generators to both restore local communications and support other PLA relief efforts. See also Ma Xiaochun, "PLA Rushes Funds, Equipment to Flooded Areas," *Xinhua*, 25 August 1998.

organic maintenance and logistics units up through depot-level dedicated to the repair, supply, maintenance, testing, and calibration of such equipment and the facilities that house them. If one had access to the figures involved (and this student does not), it would not be surprising to learn that the GSD/Comms Department has direct control over multiple thousands of PLA "communicators in the field" that are *not* part of the units within Military Regions but that are direct Communications Department assets.[461]

If these suppositions are true, they would be dramatic confirmation of GSD/Comm's central leadership role in C4I policy and operations.

The GSD Third Department, by contrast, is responsible for signals and communications intelligence (SIGINT), monitoring diplomatic, military and international communications by foreign nationals in China.[462] The actual information security role of this department is unclear from open sources, but any leaks from the Chinese side that are exposed by Third Department intercepts of foreign communications are likely submitted to the proper information security offices.

It is *possible* that the Fourth Department (ECM/Radar Department) shares responsibility for frequency management nation-wide with the Ministry of Posts and Telecommunications.

The General Staff Department also oversees numerous subordinate research institutes that focus on topics related to C4I systems. The 54th Research Institute is a long-established center for research on communications and monitoring technologies, including microwave relay communications, wireless communications scatter communications, satellite communications, satellite broadcast access, remote sensing, telemetry, surveys, communications countermeasures, intelligence, and reconnaissance. The institute produced China's first fully digital satellite communications ground station, first large ship borne satellite communications ground station, first area air defense communications network, and first man-made satellite monitoring equipment.[463] The 56th Research Institute develops computer systems with a particular focus on distributed and parallel computing. The 61st Research Institute reportedly develops command automation systems, as well as C3I systems, and hosted the 1997 Defense Information Modernization Symposium.[464] The 62nd Research Institute performs research and development on communications equipment, computers, and command automation. The former 63rd Research Institute (now merged into the PLA Science and Engineering University) in Nanjing reportedly conducted research into microwaves. One of these institutes was likely the subject of a 1999 article describing "a certain communications technology research institute under the General Staff Department" that had developed a

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[461] David Finklestein, "The General Staff Department.

[462] Ibid., p.46.

[463] *China Electronic News*, 22 September 2000.

[464] Liang Zhenxing, "New Military Revolution: Information Warfare," *Zhongguo dianzi bao*, 24 October 1997, p. 8, translated in FBIS, 12 January 1998.

phased-array antenna for satellite communications, thereby achieving "the goal of mobile communications and improving the rapid-reaction capability of its troops."[465]

A critical element of the PLA's C4I modernization effort is the China Electronic Systems Engineering Corporation (CESEC), the commercial arm of the General Staff Department Communications Department. CESEC is the key to PLA telecommunications, with interests ranging from mobile communications to secure telephone lines, computer networks, encryption, microwaves, computer applications, and dedicated military C4I systems. CESEC is largely responsible for designing, integrating, and operating the PLA's telecommunications and computer networks. It develops software applications, and is closely affiliated with critical General Staff Department research institutes (listed above) that specialize in C4I, microwave, and encryption. More important, CESEC and its affiliated subsidiaries are also well-connected to foreign telecommunications companies, providing a window for acquisition of advanced information security equipment.

Operational Implications

As a result of the efforts outlined above, the PLA's C4I capabilities have reportedly increased substantially. According to a 1997 article, more than 85 percent of key armed forces' units and more than 65 percent of coastal and border units had upgraded their communications equipment. The same article also offered an early assessment of the operational consequences of these changes:

> The use of advanced optical fiber communications facilities, satellites, long-distance automated switches and computer-controlled telephone systems has significantly accelerated the Chinese armed forces' digitization process and the rapid transmission and processing of military information. The speedy development of strategic communications networks has shortened the distance between command headquarters and grass-roots units, and between inland areas and border and coastal areas. Currently the armed forces' networks for data exchange have already linked up units garrisoned in all medium-sized and large cities in the country as well as in border and coastal areas. As a result of the automated exchange and transmission of data, graphics and pictures within the armed forces, military information can now be shared by all military units.[466]

Information Security

In recent years, the PLA has taken a keen interest in the subject of information security, first in the context of military information assurance and later broadened to include threats to Chinese national information security writ large. Since mid-1999, the PLA has assumed an especially central and public role in the debate over the national

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[465] "PLA Develops Mobile Satellite Communications Antenna," *Xinhua*, 14 December 1999.

[466] Li Xuanqing and Ma Xiaochun, "Armed Forces' Communications Become 'Multidimensional'," *Xinhua Domestic Service*, 16 July 1997.

security implications of the importation of information technology hardware and software, with numerous articles on the subject appearing in military publications.[467] These articles repeat the widely known facts about the identity tracking features of the Pentium chips and Microsoft Windows operating systems, and at least one posits that this commercial data might be given to foreign "political, economic, and military organizations."[468] These developments are particularly troubling to the military, since "much of the computer hardware and software currently used by the PLA was imported from abroad, and some was even imported from Taiwan."[469]

Overall, the articles stress the common theme that "using foreign hi-tech products to guarantee our own security is very dangerous" and prescribe the development of an indigenous information industry as the only "path of survival."[470] Perhaps the most important of these articles was the 11 January 2000 editorial in the official PLA newspaper *Liberation Army Daily* entitled "Pay Attention to the Phenomenon of 'Information Colonialism." The article strongly criticized what it perceived to be monopolistic exploitation of China by countries that "control" information technologies, and called for a shift towards indigenous substitutes at the expense of imported products.[471] Asserting that "whoever is without independent and sovereign information systems will not have genuine national independence and sovereignty," the editorial then made the bold and undoubtedly controversial suggestion that "the army should take as its new function the safeguarding of the country's information systems."[472]

Within the PLA, the headquarters-level unit most concerned with information security is the General Staff Department, given its requirement for secure operational communications.[473] Within the GSD, the mission falls to the Communications Department. The GSD also has a number of research institutes that provide scientific and technical support to these departments. While these networks require varying levels of security, the Communications Department is dedicated to maintaining adequate protections ("good secrecy") on all the networks under its control.[474] Recently reported

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[467] See Xu Xiaofang and Dan Aidong, "Serious Challenge to Information Network Security," *Jiefangjun bao*, 20 July 1999, p. 6, translated in FBIS, 20 July 1999. Cao Xueyi, "Here Comes the Wolf, Raise Your Hunting Rifle – Be Alert to Computer Network Security," *Jiefangjun bao*, 25 August 1999, p. 5, translated in FBIS, 25 August 1999; "Ensuring PRC Military Network Security," *Xiandai junshi*, 11 October 1999, pp. 35-36. Liu Youshui and Zhang Wusong, "High-Tech Development and State Security" *Jiegangbun bao*, 11 January 2000, p. 6, translated in FBIS, 11 January 2000; Chen Ting and He Jing, "'Pay Attention to the Phenomenon of Information Colonialism" *Jiefangjun bao;* PRC PLA Call for Legislation on Information Security," *Jiefangjun bao*, 12 March 2000, p.4, , 8 February 2000, translated in FBIS, 12 March 2000.

[468] Chen Ting and He Jing, "'Information Colonialism."

[469] "Legislation on Information Security."

[470] Xu Xiaofang and Dan Aidong, "Serious Challenge."

[471] Chen Ting and He Jing, "'Information Colonialism'."

[472] Ibid.

[473] Two additional organizations involved in information security are the GPD Security Department (*Baowei bu*), which oversees physical security for C4I facilities and the military equivalent of the State Secrecy Bureau, which drafts and implements high-level policy on security matters.

[474] Cao Zhi, "Chinese Army: report on the Combination of Various Armed Services," *Liaowang*, No. 30, 27 July 1998, pp. 6-7, translated in FBIS, 17 August 1998.

intrusions into Chinese military computer networks have given this task an even higher salience.[475] As one part of its information security effort, open sources confirm that the GSD/Comms must approve and license any equipment that is installed in the above military communications networks, including switches and computers.[476] At least five regulations on certification of information systems for military use can be identified. These are listed in Table 6.2 below.

Table 6.2   Certification Regulations for Military-Use Information Systems

Title	Date
Safety requirements for military communications equipment and systems (GJB 663-89)	1 Nov 89
Operation security requirements for military general-purpose computer systems (GJB 1295-91)	1 Sept 92
Security requirements of computer networks for command automation (GJB 1281-91)	1 Sept 92
Military computer security evaluation criteria (GJB 2646-96)	1 Dec 96
Terminology for military computer security	N/A

These regulations provide detailed specifications for the security levels of systems for use by military units and organizations.

Despite these efforts, however, recent official sources relate that the PLA network remains "weak, insecure, and short on combat might. It has more computers than web organization, more hardware than software, more dispersed than integrated networks, more fixed than field webs, and more webs than databases, with many problems not having been solved well."[477]

Future Trajectories

The available open sources consistently forecast continuity in the PLA's C4I modernization. In other words, the PLA will continue to build an infrastructure that is increasingly digital, automated, encrypted, faster, secure, and wider in terms of bandwidth. For example, the Guangzhou Military Region during the period from the 10th five-year plan period through the year 2010 plans to construct a network of defense

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[475] A 25 August 1999 article in *Liberation Army Daily* asserted that hackers have "directly and indirectly intruded into the Chinese military's computer systems to steal information or to sabotage the systems via various channels." Moreover, these attackers have "tried to alter the information data and infiltrate into or create problems in the Chinese military's computer systems by using computer viruses." See Cao Xueyi, "Here Comes the Wolf."

[476] Fang Shifen, "Nation's First High-Grade IN System Passes Acceptance Tests," *Zhongguo dianzi bao*, 12 December 1997, p. 5, translated in FBIS, 12 February 1998; and Zhu Youdi, "Switches Unveiled."

[477] Zhang Feng, "The Chinese Armed Forces Advance Toward the Virtual Battlefield -- Onsite Report from a Long Range Online Exercise in the Lanzhou MR," *Jiefangjun bao*, 24 November 1999, p. 5.

information systems with integrated broadband services that support mobile subscribers' connections.[478]

Conclusions

As an experiment in exploiting open-source Chinese military materials related to C4I, this paper should confirm that important, if circumscribed, benefit can be derived from continued efforts in this area. Future work will seek to exploit and integrate data from recently acquired books, as well as the technical R&D journals of the PLA's myriad IT research institutes, technical schools, and departments.

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[478] Si Liang, "Chinese Armed Forces Are Increasing Their Capacity for Fighting Electronic Information Warfare," *Zhongguo tongxun She*, 9 August 1999.